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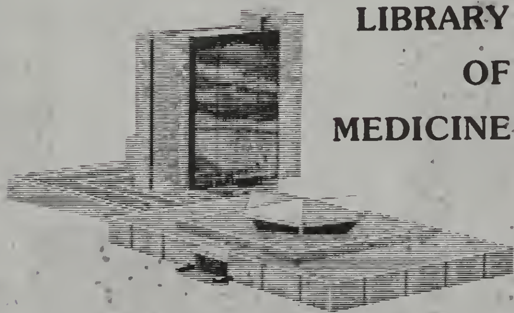

Sickness and Accidents

Modern Methods of Treatment

Information for Nurses in Home and Hospital

BY

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ILLUSTRATED

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TO

DARIUS O. MILLS ESQ.,

FOUNDER OF

THE MILLS TRAINING SCHOOL FOR NURSES

BELLEVUE HOSPITAL

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THIS MANUAL IS RESPECTFULLY DEDICATED

PREFACE TO THE SECOND EDITION.

The success with which my exertions have been crowned in this little work, has far exceeded any reasonable expectations, the entire first edition having been sold within a few months after publication.

The present edition has been carefully revised, and all errors, wherever detected, have been expunged.

Notwithstanding the small compass, the scope of the work will be found quite extensive, since condensation has been the aim of the author in every page, where brevity did not demand any important omission. It would have been an easier task to have produced a larger volume, but, as Pope says, "Half our knowledge we must snatch, not take." If this be true of general erudition, it is certainly true of Medical information as it is taught in the Training Schools of to-day, and in view of this fact there seems to be a real need for books which present their subjects in an assimilable form.

The author would here acknowledge his obligations and return his thanks to Mr. E. Aloysius Moore, graduate The Mills Training School, for much valuable assistance in the correction and preparation of this edition.

M. W. C.

TABLE OF CONTENTS.

AUTHORITIES.

The following are the writers whose works were chiefly consulted in compiling the contents of this manual on nursing. Owing to the author having gleaned all the information possible in every field available, and having condensed or enlarged all such material obtained according to its importance, or bearing on the subjects now treated, and having also contributed what he deemed necessary from his personal experience gained by observation in the practice of his profession, it will be apparent what a number of unnecessary repetitions and complications of the various names would arise were he to acknowledge his authorities differently.

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New York City.

INFORMATION FOR NURSES.

INTRODUCTORY.

Nature.—The three classes of Nature are the Mineral, Vegetable and Animal Kingdoms; they are divided into Organic and Inorganic bodies.

Organic bodies are those having organs by which they grow; as animals and plants.

Inorganic bodies are those that are naturally destitute of life; such as air, water, minerals, soils, etc.

Mineral Kingdom.—The Mineral Kingdom includes all inorganic bodies.

Vegetable Kingdom.—The Vegetable Kingdom are those organic bodies that have no power to feel.

Animal Kingdom.—The Animal Kingdom includes all the organic bodies that have the power to feel and of voluntary motion.

Organic bodies grow, require food, reproduce after their kind, and are subject to death. Inorganic bodies only grow by addition to the outside.

Organs are the parts of an organized body, such as in an animal, the mouth, the heart, the eye, etc., and, in a plant, the roots, the leaves, etc.

Function.—The work of a particular organ is called its function.

Anatomy is the science that treats of the structure, form, number and position of the different organs.

Physiology is the science that treats of the functions

or uses of the different organs. If the science treats of the organs of man only, it is called Human Anatomy or Human Physiology.

Structure of Organs.—Organs are composed of a variety of structures called *tissues*, which are also composed of *cells*. The science which treats of the minute structure of the tissue and cells of animals and plants, is called *Histology*.

Cell.—A cell is a minute sac filled with a fluid called *protoplasm* in which is located another sac called the *nucleus*, which also contains a sac—the nucleolus.

Tissue is the texture of which any part of the body is composed. Tissue is formed by the growth and reproduction of the cells. *Fiber* is the thread-like portion, which, in part, forms the tissue. The names of the various tissue are—Osseous, Muscular, Connective, Cartilaginous, Adipose and Nervous tissue.

Chemistry is the science which treats of the ultimate elements of substance. Of the sixty-five chemical elements or simple bodies known to exist, only fifteen have been found as normal constituents of the human body. They are the following:

1. Oxygen.	6. Phosphorus.	11. Chlorine.
2. Hydrogen.	7. Calcium.	12. Fluorine.
3. Carbon.	8. Magnesium.	13. Silicon.
4. Nitrogen.	9. Sodium.	14. Iron.
5. Sulphur.	10. Potassium.	15. Manganese.

Solids of the Body.—The solids of the body are the bones, teeth, muscles, ligaments, cartilages, nerves, hair. nails, skin, membranes, viscera, and vessels.

Fluids of the Body.—The principal fluids of the body are the blood, chyle, lymph, saliva, gastric juice, pancreatic juice, synovia, mucous, and serum. Those fluids con-

tain the materials from which the body is formed, and also serve as a medium for carrying off the waste and decayed matter from the system.

Systems.—Several organs of similar structure taken together is called a system; the different systems of organs in the human body are—

The Osseous System, the Muscular System, the Digestive System, the Circulatory System, the Respiratory System and the Nervous System.

THE OSSEOUS SYSTEM.

Human Skeleton.—A human skeleton weighs about one-tenth of the weight of the body, contains 206 bones, besides the teeth, and has four uses.—

Uses.—1. It gives shape to the body.
2. It supports the body.
3. It enables us to move and extend our limbs.
4. It protects the delicate organs.

Composition.—They are composed of animal and mineral matter, the animal matter consists of *cartilage* and *blood-vessels*, and the mineral consists of *phosphate of lime* and *carbonate of lime*. The animal matter is much in excess in youth.

Periosteum and Endosteum.—Bone is composed of an outer compact layer, and an inner cellular or spongy structure. It is surrounded, except at the articular cartilages, by a vascular fibrous membrane, the *periosteum*, which receives the insertions of all tendons, ligaments, etc., and the central cavity of long bones is lined by a similar structure, *the endosteum*.

Analysis of the Skeleton.

1 The Head 28 Bones	1 Cranium 8 Bones	1 Frontal	*forehead.*
		1 Occipital	*back and base of skull.*
		2 Parietals	*side of head.*
		2 Temporals	*temple.*
		1 Sphenoid	*wedge shaped.*
		1 Ethmoid	*sieve-like bone at root of nose.*
	2 The Face 14 Bones	2 Superior Maxillary	*upper jaw bones.*
		1 Inferior Maxillary	*lower jaw bone.*
		2 Malar	*cheek bones.*
		2 Lachrymal	*small thin bones which form part of the inner wall of orbits.*
		2 Turbinated	*scroll-like bones each side of the nose.*
		2 Nasal	*bridge of nose.*
		1 Vomer	*the bone between the nostrils.*
		2 Palate	*back part of the roof of the mouth.*
	3 The Ears 6 Bones	Malleris	*hammer.*
		Incus	*anvil.*
		Stapes	*stirrup.*
2 The Trunk 54 Bones	1 Spinal Column	Cervical Vertebræ	*seven vertebræ of neck.*
		Dorsal Vertebræ	*twelve vertebræ of back*
		Lumbar Vertebræ	*five vertebræ of loins.*
	2 The Ribs	True Ribs False Ribs	*twelve on each side: the upper seven are called the true ribs, the lower ones are false or floating ribs.*
	3	The Sternum	*the breast bone.*
	4	The OS Hyoides	*bone at root of tongue.*
	5 The Pelvis	2 Innominata	*known as the hip bones: until puberty each consist of three bones united, the ilium, pubes, and ischium.*
		Saccrum	*being formed of five vertebre compacted together.*
		Coccyx	*consists of three or four small bones which often unite into a firm piece with the sacrum.*
3 The Limbs 124 Bones	Upper Limbs 64 Bones	2 Clavicle 2 Scapula	*shoulder.*
		2 Humerus	*arm*
		2 Ulna 2 Radius	*forearm.*
		16 Carpal	*wrist bone.*
		10 Metacarpal	*in the palm*
		28 Phalanges	*three in each finger and two in the thumb.*
	Lower Limbs 60 Bones	2 Femur	*thigh bone.*
		2 Patella	*knee pan.*
		2 Tibia 2 Fibula	*leg bone.*
		14 Tarsal	*forming the instep.*
		10 Metatarsal	*articulates with the tarsals and phalanges.*
		28 Phalanges	*two in great toe three in each of the others.*

Eight carpus bones of each hand.

1 Scaphoide. 1 Trapezium.
1 Semilunare. 1 Trapeziodes.
1 Cuneiforme. 1 Magnum.
1 Pisiforme. 1 Unciforme.

Seven tarsus bones of each foot.

1 Calcaneum. 1 Astragalus.
1 Naviculare. 1 Cuboid.
3 Cuneiform Bones.

Classification.—The bones are divided into four classes, namely,—*long, flat, short* and *irregular.*

Long Bones.—The long bones are used as a means of *support* to the other portions of the skeleton, or as *levers* upon which the muscular system can act to the best advantage.

Flat Bones.—The flat bones are important agents in the *protection* of the organs contained in the various cavities of the body, as in the cranium, thorax and pelvis, and from their shape they serve to give *extensive attachment* to *muscles.*

Short Bones.—The short bones are situated where great *solidity*, a *limited amount* of *motion* and *compactness* are required.

Irregular Bones.—The irregular bones include the vertebræ, sacrum, coccyx, the temporal, ethmoid, and sphenoid bones, and the bones of the face, except the *nasal, lachrymal, and vomer.*

Articulations.—The part of union of two or more bones forms an articulation, or joint, the connection being made in various ways, according to the kind and amount of motion desired.

Ligaments.—The movable joints are connected by strong fibrous bands called ligaments; these ligaments are of silvery whiteness and very unyielding.

Synovia is the fluid secreted in the cavities of joints for the purpose of lubrication. The thin membrane covering the ends of the bones and secreting the lubricating fluid is called the *synovian membrane.*

Cartilage.—The ligament secures firmness to the joint, it must also have flexibility and smoothness of motion. The ends of the bone are covered by a thin layer of cartilage, which being smooth and elastic, renders all the movements of the skin very easy.

Table of the Principal Muscles.

THE HEAD	Occipito Frontalis	*moves the scalp and eyebrows.*
	Orbicularis Palpabræum	*to close the eyelids.*
	Levator Palpabræ	*opens the eyes.*
	Recti: Superior, Inferior, Internus, Externus	*move the eyeball.*
	Buccinator	*to compress the cheek.*
	Risorius	*the laughing muscle.*
	Temporal, Masseter	*raise the lower jaw.*
THE NECK	Platysma Myoides, Sterno-Mastoid	*move the head forward.*
	Scalenia: Anticus, Medius, Posticus	*move the neck from side to side.*
THE TRUNK	Pectoralis	*move the arm forward.*
	Latissimus dorsi	*move the arm backward.*
	Trapezius, Serratus Magnus, Rhomboideus: Major, Minor	*move shoulder blade.*
	Intercostals	*move the ribs in respiration.*
	External Oblique, Internal Oblique	*move the trunk forward.*
	Diaphragm	*the muscles of respiration and expulsion.*
THE LOWER LIMB	Psoas Magnus, Iliacus, Pectineus, Adductor: Longus, Brevis, Magnus	*move the thigh forward.*
	Gluteus, Pyriformis	*move the leg backward.*
	Sartorius	*to flex and cross the leg.*
	Biceps	*to flex leg and rotate it outward*
	Rectus, Vastus: Externus, Internus	*extend the leg.*
	Tibialis: Anticus, Posticus; Peroneus: Longus, Brevis, Tertius; Gastrocnemius	*moves the foot.*
THE UPPER LIMB	Deltoid	*raises the arm.*
	Teresmajor	*lowers the arm.*
	Subscapularis, Supra Spinatus, Infra Spinatus	*rotate the arm.*
	Biceps	*bends forearm.*
	Triceps	*to extend forearm.*
	Pronator: Radii teres, Quadratus	*rotate forearm.*
	Supinator	*to supinate the hand.*
	Flexor Carpi Radialis, " " Ulnaris, Extensor Carpi Radialis, " " Ulnaris	*move the hand.*

THE MUSCULAR SYSTEM.

Muscle is animal tissue, generally known as flesh or lean meat; its structure consists of parallel or nearly parallel fleshy bundles, enclosed in coverings of cellular tissue capable of being indefinitely divided.

Microscopic Structure.—Viewed through a microscope the bundles are called fasciculi, and are made up of still smaller fibres, called ultimate fibers, and these are made up of still smaller fibers, called fibrils

Ultimate Fibers.—They seem to be polygonal in form, and have an average diameter of about one-four-hundreth of an inch.

Fibrils.—They are only about one ten-thousandth of an inch in diameter, and are composed of rows of small cells arranged like a string of beads. There is a fluid or semi-fluid mass of living matter called protoplasmic, found in the cells of the fibrils, and there are on an average 650 fibrils in an ultimate fiber.

Classes of Muscles.—The muscles are divided into two classes, Striated and Non-striated. The former are also called Voluntary and the latter Involuntary.

Striated.—One that in its normal action is controlled by the will, as the flexors and extensors of the arm.

Non-striated.—One acting independently of the will. The heart, however, is both striated and non-striated, and while we wink constantly without effort, we can restrain or control the emotion to a certain extent.

Origin.—The *origin* of a *muscle* is at its fixed point or commencement, and its insertion is its attachment to the part which it moves. There are more than 500 muscles in man, and they are usually arranged in pairs, that is, both sides of the body have similar muscles,

The purpose served by arranging the muscles in pairs, is, there is motion in opposite directions, when one muscle contracts its antagonist relaxes. The amount of single or unmated muscles is variously stated by different authors, some saying twelve, others thirteen.

Contractibility of Muscles.—The characteristic property of muscles is their contractibility, which means the fibers all shorten themselves, and the muscles swell out or become thicker, as does a piece of india-rubber. There are two kinds of contraction in muscles.

Kinds of Contraction.—1. From their own elasticity, as when a muscle is cut into by accident, the two ends separate because they are drawn apart by the contraction of the fibers.

2. From stimulation through the nerves.—They are subject to the control of the will and the guidance of the muscular sense. The will determines an act; the muscular sense the effort necessary to its performance.

Muscular Sense is the power we possess of judging of the weight of anything by lifting it, thus regulating without conscious volition the force employed.

There are five different forms of muscles.—

1. Spindle shaped. One terminating at each extremity in a tendon, and is smaller at the ends than in the middle.

2. Radiate. One with the fibers arranged like the rays of a fan.

3. Penniform. One with the fibers disposed on one side of a tendon.

4. Bi-penniform. One with the fibers disposed on both sides of a tendon like a feather.

5. Sphincter. One running in a circular or orbicular direction.

Extensors and Flexors.—Muscles passing over the back of a joint are called Extensors, and those lying in front of a joint are called Flexors.

Perimysium is the membranous covering investing each muscle.

Myolemma is the thin transparent sheath enclosing each fiber of a muscle.

THE SKIN.

The skin is composed of two layers, the epidermis or cuticle, and the derma or cutis.

Cuticle.—The cuticle is the outer skin and is only the covering of the true skin. It neither bleeds when cut, nor is sensible to pain, heat or cold; it has no vitality.

Cutis.—It is the lower layer and is the true skin. It is composed of fibrous tissue, and is abundantly supplied with blood vessels, nerves and lymphatics.

Papillæ are the protuberances which roughen the skin, and are supplied with one or more loops of nerves. The papillæ are most abundant upon the palms and soles.

Corium.—The corium is the innermost layer, and possesses vitality and sensibility and contains all the vessels of the skin.

Gland.—A gland is a secreting organ made up of small bodies of minute proportions each of which contain an artery, a vein, and a duct. Glands secrete in their cells some liquid from the blood.

The physiological name of the sweat glands are **Sudoriferous** Glands. The pores of the skin are the outlets of the ducts or tubes of the sweat glands; there

are at least 2,800 sweat glands in every square inch of the skin, which would make 7,000,000 in the whole body.

Perspiration is a transparent liquid poured out by the sudoriferous glands, and is of an acid reaction and salty taste. About one per cent of the perspiration is solid matter and the average amount of perspiration in an adult per day is two pounds.

Sebaceous Glands are oil glands or little sacs which secrete an oil that flows through their ducts to the roots of the hair and thence oozes out on the cuticle, their office is to lubricate the hair and keep the skin in a flexible condition.

Mucous Membrane is a thin tissue or skin covering the open cavities of the body; it begins in the mouth and nose and lines all the passages to the lungs, the stomach and other organs.

Mucus is the fluid secreted by a membrane and serving to lubricate it.

Serous Membrane.—The serous membrane lines the cavity of the body not open to the external air, as the chest and abdomen. It also lines the outside of the great internal organs of the body, such as the lungs and intestines.

Serum is the thin part of the blood.

Connective Tissue.—It is the tissue or fibers of which the lower layer of the skin (the cutis), and the corresponding layer of the mucous and serous membranes are composed. It is so called because it spreads from the cutis into the mucous membrane, and invests muscles, bones and cartilages. Thus it connects all parts of the body.

Dermatology is the branch of medicine which treats of the skin and its diseases.

THE DIGESTIVE SYSTEM.

Digestive Organs.—The digestive organs are the mouth, teeth, salivary glands, palate, pharynx, œsophagus, stomach, intestines, liver, pancreas and spleen.

Mouth and Palate.—The palate is the roof of the mouth and consists of two parts, the soft palate in the back part of the mouth, and the hard palate, which lies between the upper teeth. The lower part of the mouth is called the floor, and is included within the lower teeth. The mouth contains the teeth, salivary glands and other small glands and follicles situated upon the floor and back part.

Tonsils are simply aggregations of follicles situated in the upper part of the throat. Their use is not clearly understood.

Teeth.—There are thirty-two teeth in all, or eight in each half jaw, similarly shaped and arranged; the marked characteristic of the teeth is their hardness, being the hardest substance in the body. **Enamel.**—The enamel of the teeth is a thick coat covering the body of the tooth down to the gum, and giving it its hardness, the enamel is nearly all mineral; only two and one-half per cent is animal matter. **Kinds of Teeth.**—The number of each kind of teeth are, four incisors (cutting), two canines (tearing), four bicuspids, and six molars (grinding), sixteen in all in each jaw.

Salivary Glands.—There are three pairs of glands with ducts opening into the mouth for the purpose of secreting a fluid to keep the mouth moist, and to moisten food as it is chewed. They are called the Parotid, the Submaxillary and the Sublingual. There is from three to six pounds of saliva secreted daily by an adult in good health.

Parotid Gland.—It is the largest of the salivary glands, and is situated just under the ear and behind the angle of the jaw; a duct called Stenos from the gland opens into the mouth opposite the second molar tooth of the upper jaw.

Submaxillary Gland.—It is situated within the lower jaw, and its duct opens into the mouth at the side of the tongue.

Sublingual Gland.—It is in the floor of the mouth, and has seven or eight small ducts opening into the mouth.

Ptyaline is a peculiar organic substance contained in the saliva which changes the starch of masticated food into glucose or grape sugar.

Œsophagus is a large membranous tube extending from the throat to the stomach. It is part of the alimentary canal.

Pharynx.—It is the part of the alimentary canal in the throat, and a funnel-shaped cavity about four inches long, extending from the mouth to a point behind the Adam's apple: the pharynx has four passages, one leading upward and forward to the nose; the second, forward to the mouth; the third, downward to the lungs; and the fourth, downward and backward to the stomach.

Stomach.—Has been called pear-shaped, and has also been compared to a bag-pipe, it is about twelve inches long and four inches in diameter, and holds about three pints. Of the two membranes that line the stomach, the inner is the mucous membrane, which secretes digestive fluids; the outer is the serous membrane, which is well lubricated. Between these two membranes is a stout muscular coat The stomach is located in the upper portion of the left side of the

abdomen, immediately beneath the diaphragm, and inclines obliquely downward from left to right. The stomach has two openings, the Cardiac, which is connected with the Œsophagus, and the Pyloric, which is connected with the intestines.

Intestines.—The intestines are divided into two classes called the small, and the large; the small intestines are the Duodenum, the Jejunum, and the Ileum; the large intestines are the Cæcum, the Colon, and the Rectum. The aggregate length of the intestines in man is about thirty feet; their structure is similar to that of the stomach; they are formed of the serous and mucous membranes, with a muscular coat between.

The physiological names of the different parts of the intestines are (1) Duodenum, (2) Jejunum, (3) Ilium, (4) Cæcum, (5) Vermiform Appendage, (6) Colon, (7) Sigmoid flexure, (8) Rectum.

Duodenum is sometimes called the second stomach. It is the first division of the intestines, and is called the duodenum (twelves), because its length is of the breadth of twelve fingers, or about ten inches. It communicates with the pyloric orifice on the right extremity of the stomach, and runs slightly backwards and upwards until it terminates in the Jejunum.

Jejunum.—It is the intestine next below the duodenum, its name means "empty," and it is so called because it is always found in this condition after death.

Ilium. –It is the third division of the intestines, and is the smallest, and is about fifteen feet in length. It is named from a Greek word, meaning "to twist," and is so called on account of its tortuous course.

Cæcum.—It is the fourth division of the intestines

and is a short sac not exceeding four inches in length, but of a larger diameter than the small intestines.

Vermiform Appendage.—It is a small part of the intestines attached to the cæcum, and is so named because it is shaped like a worm. It is not known that it serves any useful purpose in man, but it is largely developed and of great service in some of the lower animals.

Colon.—It is that division of the intestines which on the right side of the body passes upward, then crosses horizontally to the left side of the body and then passes downward. It is from five to eight feet long.

Sigmoid Flexure of the Colon.—Curved like an s, first upwards then downwards, extending from the crest of the left ileum to the left sacro-iliac synchondrosis.

Rectum.—From the last named point to the anus; is 6 to 8 inches long, not sacculated, and, though not straight, is straighter than the rest of the gut. It curves laterally to the middle of the sacrum, and backwards about an inch above its termination at the *Anus*, where it is distended into a pouch. This lower inch has no peritoneal investment.

Liver.—The liver is the largest of the glands; it is of a reddish yellow color, and its chief purpose is to secrete bile; it is situated on the right side of the abdomen, below the diaphragm. Its situation is on the right side of the body, corresponding to that of the stomach on the left side; it measures about a foot in its longest diameter, and weighs on an average four pounds; it is divided into five lobes and each of these is composed of minute divisions or lobules about the size of a millet seed. Each of these lobules contains an artery, a vein, and a network of ducts.

Bile.—It is a fluid of a dark green color and bitter taste, secreted by the liver. It acts upon the food in some way not fully understood. When not needed in digestion, the bile is stored away in the gall bladder which is under the right side of the liver.

Pancreas.—The pancreas is a gland about six inches in length, situated behind the stomach. The pancreatic fluid is a liquid secreted by the pancreas at the rate of from five to seven ounces per day. It closely resembles saliva, and in the process of digestion produces important chemical changes in the food.

Alimentary Canal.—It is the canal or passage for the food in the process of digestion; it commences with the mouth and includes the Pharynx, Œsophagus, Stomach, and the whole length of the intestines.

Process of Digestion.—The following are the principal steps in the process of digestion:

1. Mastication and Insalivation in the mouth.
2. Deglutition or swallowing.
3. Passage of the food through the Œsophagus into the stomach.
4. Gastric digestion in the stomach.
5. Intestinal digestion.
6. Absorption into the blood.

Gastric Juice.—As soon as food enters the stomach the blood vessels of the inner membraneous lining are filled, the membrane becomes of a bright red color and the gastric juice is rapidly secreted; the amount of gastric juice secreted is variously estimated to be from five to thirty-seven pounds a day.

Pepsin is a peculiar organic substance found in the gastric juice, and is one of the most important aids to digestion. It constitutes about two-thirds of the gastric fluid and acts as a ferment on the fluid. Pepsin

as an article of commerce is obtained from the stomachs of animals. Pigs or calves are excited by savory food, which they are not allowed to eat, and then at once killed.

Chyme is the name given to that state of food after it is thoroughly dissolved and acted upon by the stomach.

Chyle is a milky fluid formed from chyme in the duodenum by the action of the pancreatic juice and the bile.

When all food in the stomach is dissolved into the liquid condition called chyme, it passes through the pyloric orifice into the duodenum, where intestinal digestion is commenced by the secretion of the liver and pancreas, and the chyme becomes chyle, which passes from the large intestine into the small intestines and is then carried to the liver, where some important change not fully understood is again made, when it is poured as blood into the heart.

Trypsin is a ferment found in the pancreatic fluid which performs an important work in changing chyme into chyle.

Portal Vein.—It is the vein which carries to the liver the food absorbed by the veins of the stomach and intestines.

Lacteals are small tubes or vessels for carrying chyle from the intestines to the thoracic duct.

Digestion is the process by which food is prepared to become the nutrient part of the blood.

Spleen.—It is an oblong, flattened organ of a dark-bluish color, situated on the left side, in contact with the diaphragm, stomach, and pancreas It has no outlet. It is not known what function it performs.

THE CIRCULATORY SYSTEM.

The organs of circulation are the heart, the arteries, the veins, and the capillaries.

Blood.—The blood is the liquid by means of which the circulation is effected; it permeates every part of the body, except the cuticle, nails, hair, etc. The average quantity in each person is almost eighteen pounds; its specific gravity is about 1055. The blood is hot, its temperature being about 100° Fahr. When examined with a microscope it is found to consist of a transparent liquid and minute circular bodies called corpuscles floating in the liquid. The are three different names given to the liquid portion of the blood: Plasma, Serum, and Liquor Sanguinis.

Corpuscles.—They are minute, flattened discs, with both surfaces slightly concave. There are two kinds, the red and the white. The latter are few in number compared with the former. These corpuscles seem to be a kind of living atoms, for they have their period of birth, or growth, of decay, and of death; and they are nourished by the liquid in which they float. Countless myriads of them come into existence every day; and it is said that at every pulsation of the heart nearly twenty millions of them die.

Functions.—The blood has been called liquid flesh, but it is more than that, since it contains the material for the making of every organ. The plasma is rich in mineral matter for the bones, and in albumen for the muscles; the red discs are the air cells of the blood. They contain the oxygen so essential to every operation of life. Wherever there is work to be done or repair to be made, there the oxygen is needed; it stimulates to action and tears down all that is worn out. In this process it combines with and actually burns out

parts of the muscles and other tissues, as wood is burned in a stove. The blood, now foul with the burned matter, the refuse of the fire, is caught up by the circulation and whirled back to the lungs, where it is again purified and sent bounding on its way.

Heart.—The heart is the engine which propels the blood. It is a hollow muscular organ, *pear-shaped* and about the size of the fist. It hangs point downwards just to the left of the center of the chest; it has two *movements*, consisting of an alternate contraction and expansion, the former is called the Systole, and the latter the Diastole; during the diastole the blood flows into the heart, to be expelled by the systole. The alternation of the movement constitutes the beating of the heart, which we can hear so distinctly between the fifth and sixth ribs. It is everywhere free or unattached except at its base, which by means of large blood vessels, is **attached** to the vertebral column. It has four **chambers**,—two auricles and two ventricles. The left and right division of the heart are separated by an impassable wall, so that there is no communication between them. The right division is somtimes called the pulmonic heart and the left the systemic heart. The heart ordinarily contains about one pint of blood.

Auricles are reservoirs for receiving the blood. The left auricle receives bright and pure blood from the lungs; the right one receives the dark and foul blood after it has made the tour of the body.

Ventricles.—They are the cavities or chambers from which the blood is forced outward. The blood goes from the left ventricle into the large tube called the Aorta, which leads to all parts of the body, and the blood from the right ventricle goes into the pulmonary artery, leading to the lungs.

Valves.—They are peculiar forms of muscular and tendonous fibers, making a kind of curtain, which will allow the blood to flow in one direction, but not in the opposite direction. There are three different kinds of valves in the heart,—the tricuspid, the bicuspid, and the semi-lunar.

Tricuspid is at the opening of the right ventricle; it consists of three folds or flaps of membrane.

Bicuspid is in the left ventricle and is also called the *mitral valve.*

Semi-lunar—They are three valves of a half-moon shape in the passages outward from the ventricles.

Pericardium.—The heart is enclosed in a loose sac or serous membrane called the pericardium, this secretes a lubricating fluid and is as smooth as satin.

Arteries are the tube-like canals which convey the blood from the heart to nourish the system. In their distribution the arteries freely communicate with one another, the large branches as well as the small forming what are called **anastomoses or inosculations,** p rmitting the establishment of the collateral circulation after obliteration of a main artery. They possess **three coats,** (1) *an internal,* or *Intima,* (2) *a middle* (*Media*), composed in small vessels of circular muscular fibres, in the larger chiefly of yellow elastic tissue; this prevents the arteries from collapsing when cut across, (3) an *external* (*adventitia*), composed of connective tissue.

Veins.—They are vessels returning venous blood—*i. e.*, blood surcharged with carbonic acid, to the heart, and have the same coat as arteries, but not so thick, especially in the middle, in consequence collapsing when divided. All veins freely anastomose, and valves similar in construction to those already described (the

semi-lunar valve of the heart), are placed at convenient intervals, especially in the lower extremities to guard the blood in its course and prevent its setting backward.

Capillaries form a fine network of tubes, connecting the ends of the arteries with the veins; they blend, however, with the extremities of these two systems, so that it is impossible to tell just where an artery ends and a vein begins. The air cells of the blood deposit there their oxygen and receive carbonic acid, while in the delicate capillaries of the lungs they give up their load of carbonic acid in exchange for oxygen.

The Pulmonic or Lesser Circulation.—The dark blood collects in the right auricle, thence passes into the right ventricle, thence into the pulmonary artery, thence to the lungs, returning through the four pulmonary veins to the left auricle.

Systemic or Greater Circulation.—From the left auricle to the left ventricle, thence into the great Aorta, thence into the arteries, capillaries, and veins; it returns through the vena cava, ascending and descending, into the right auricle.

Portal Circulation.—It is the passing of the blood that returns from the alimentary canal to and through the liver before reaching the heart. The veins from the stomach and intestines lead into one large vein called the portal vein.

Entire Circulation.—Left ventricle, aorta, arteries, capillaries, veins, vena cava, right auricle, right ventricle, pulmonary arteries, lungs, pulmonary veins, left auricle, to the left ventricle or place of beginning.

Rapidity of Circulation.—It is estimated that some of the blood makes the tour of the body in about

twenty-three seconds, and that the entire mass passes through the heart in from one to two minutes.

Pressure.—The forces which propel the blood through the system are:—

(1) The contraction of the heart, (2) elasticity of the arteries, (3) capillary force, (4) muscular pressure, (5) act of inspiration, (6) Arterialization of blood.

Lymph is a thin, colorless liquid which circulates through the lymphatics. It is much like the serum of the blood, and is thought to be an overflow from the blood-vessels.

Lymphatics.—They are minute vessels like capillaries, which proceed from various parts of the body, and unite into larger trunks, which empty into the veins in the lower part of the neck.

Lymphatic Glands.—They are hard bodies of various sizes through which the lymphatics pass. They are often enlarged by disease so that they can be felt.

Table of the Principal Arteries.

The Head	Common Carotid	Internal External.
	Vertebral.	
	Ophthalmic.	
The Trunk	The Aorta, arising from the heart, is the main arterial trunk.	
	Coronary, sudplies the walls of the heart.	
	Bronchial, supplies the lungs.	
	Intercostals, supply the walls of chest.	
	Gastric, supplies the stomach.	
	Hepatic, supplies the liver.	
	Splenic, supples the spleen.	
	Renal, supplies the kidneys.	
	Mesenterics, supply the bowels.	
	Spinal, supplies the spinal cord.	
The upper Limb.	Branches of the Axillary	supply shoulder.
	" " Brachial	supply the arm.
	" " Radial " " Ulnar	supply the fore-arm and fingers.
The lower Limb.	Branches of the Femoral " Popliteal " Tibial " Peroneal	supply the leg and foot.

THE URINARY ORGANS.

Kidneys.—The Kidneys are situated in the lumbar region, one on each side of the vertebral column, each kidney reaching from the eleventh rib nearly to the iliac crest, but the right a little lower than the left; they lie imbedded in a mass of fat behind the peritoneum, which retains them in place with the aid of their blood vessels. Each measures about four inches in length, two in breadth, and one inch in thickness, they weigh in the male, from 4½ to 6 ounces; in the female, 4 to 5½ ounces.

Structure.—They are composed of convoluted and straight uriniferous tubules, blood-vessels, nerves, lymphatics, connective tissue, and Malpighian bodies.

Function.—The function of the kidneys is the secretion of urine; they do not act constantly, only alternately.

Ureter.—The ureter is the tubular, cylindrical, excretory duct of the kidney, of the size of a goose-quill, 16 to 18 inches long, extending from pelvis of kidneys to base of bladder, into which it opens by a constricted orifice, after having passed obliquely for nearly an inch between its muscular and mucous coats. It has a *fibrous coat*, continous with capsule (a fibrous *capsule* envelopes kidneys), of kidney and fibrous tissue of bladder, a *muscular* composed of longitudinal and circular fibers, a *mucous* covered with several layers of many shaped epithelial cells.

Function.—Its function is to carry the urine from the pelvis of each kidney to the bladder.

Bladder is the musculo-membranous reservoir for the urine, situated behind the pubes, between it and rectum in male, between the pubes and uterus in female; when moderately distended its dimensions are,

length five inches, breadth three inches, capacity about one pint; in the child it is an abdominal organ, and also in adults when distended, it has four coats: Peritoneal, Muscular, Cellular and Mucous.

Function.—The function of the bladder is to retain the urine until a sufficient quantity has been collected to pass, in order that a constant dribble may not take place.

Penis.—The penis has a root, body and extremity, or glans penis, and consists of three elongated cylindrical masses of erectile, composed of a fibrous sheath which sends inward numerous interlacing bands (trabeculæ), forming numerous meshes in which lie the blood-vessels. The upper two cylindrical bodies lying side by side, like a double-barrel gun, are called the corpora cavernosa; the third much smaller lying in median line beneath, like the ramrod of a gun, is the corpus spongrosum.

Urethra.—It extends from neck of bladder to meatus urinanus, measuring from 8 to 9 inches, presenting a double curve when penis is flaccid, but a single one with convexity downward during erection.

Testes and Coverings.—The testes are the procreating glands, those which secrete the seminal fluid, and are each obliquely suspended in the scrotum by their own spermatic cord. They are from 1½ to 2 inches long, 1 inch in breadth, weighing from 6 to 8 drachms, the left being slightly larger.

Scrotum is the cutaneous pouch containing the testicles and part of spermatic cords.

Vas deferens.—It is the duct of the testicle, about 2 feet in length. It passes to the lower part of the epididymis, with which it is continous, where it becomes exceedingly tortous in its course.

Epididymis consist of a tube about twenty feet long.

THE RESPIRATORY SYSTEM.

The respiratory and vocal organs are the Larynx, the Trachea, the Bronchi, and the Lungs, all being acted upon by a complicated series of muscles.

Larynx.—It is the organ of the voice and is a short, triangular, and cartilaginous cavity, extending from the root of the tongue to the trachea; it is separated from the spinal column by the Pharynx. "Adam's Apple" is in the front part of the larynx, and is a prominence in the neck which can be seen or felt. Vocal sounds are produced by vibration of cords located in the larynx. A large larynx usually gives a deep toned voice; a smaller one a comparatively higher pitch. The cavity in the larynx is greater in the male than in the female. Its **cartilages** are seven in number:—two Arytenoids, two Cimliform, one Cricoid, one Thyroid, and one Epiglottis.

Vocal Cords.—They are not strings but simply folds of mucous membrane that lines the larynx; two of these folds are above and two below; vocal **sounds** are **produced** when the cords are drawn tightly, so as to nearly close the air passage; the air is forced between them, and they are made to vibrate rapidly and thus produce sound.

Glottis is the opening from the throat into the larynx.

Epiglottis.—It is the cover of the larynx, or a spoon-shaped lid, which opens freely for the passage of air, but closes when we swallow food.

Trachea is a vertical tube about an inch in diameter, and four inches in length, extending from the larynx to the bronchi.

Bronchi are two branches of the trachea which carry the air to the lungs; as soon as they enter the lung they divide and subdivide into smaller branches called bronchiæ.

Lungs are two large sponge-like masses which fill up nearly the whole cavity of the chest, on each side of the heart. They are divided into lobes, the right lung having three, the left only two. They are formed of the bronchial tubes and air-cells, and blood-vessels of the pulmonic circulation. There are two great sets of passages in the lungs, one for air and one for the blood; they are brought as closely together as possible, so as to expose the blood to the action of the air.

Pleura is a thin, delicate membrane lining the outside of the lungs, and also the inner surface of the chest.

Diaphragm is a thin broad circular partition across the body, separating the abdomen from the chest.

Intercostal Muscles are the muscles whose fibers fill the spaces between the ribs; they are employed in breathing.

Inhalation and Expiration.—When the air is inhaled the ribs are elevated, and the diaphragm lowered, and thus the chest is enlarged. When air is exhaled the walls of the abdomen are drawn in, and the diaphragm pressed upward, while the ribs are pulled downward, thus diminishing the size of the chest, and forcing the air out. In a full inspiration a man of medium size will inhale about 230 cubic inches. It is impossible to exhale all the air from the lungs; about

100 cubic inches always remain after the most forcible expiration we can make.

Object of Respiration.—Its immediate objest is the purification of the blood, and its ultimate objects are the production of heat, motion, and nervous energy. There are two kinds of respiration, abdominal, which is performed chiefly by the diaphragm, and pectoral, which is perfcrmed chiefly by the ribs.

Composition of Pure Air.—It is composed of oxygen and nitrogen, in about the proportion cf 21 to 79. There is always some carbonic acid gas in the atmosphere, and traces of other gaseous substances.

Oxygen.—The oxygen is the life giving principle of the air for all forms of animated nature; it is also the supporter of combustion.

Nitrogen.—It dilutes the oxygen, which is too active and rich to be breathed in its undiluted state.

Carbonic Acid.—Some of the characteristics of carbonic gas are: It destroys life by suffocation, and extinguishes flame. It is, however, an essential food of plants. There is from one to three pounds exhaled from the lungs in twenty-four hours.

Action of Air in the Lungs.—The air gives up its oxygen to the blood, and receives carbonic acid gas, water and waste matter from the system, which is exhaled by mouth and nostrils.

Action in which Air and Blood are Brought Together.—The impure blood is carried to the pulmonary capillaries which surround the air cells of the lungs; through the thin walls of the capillaries the carbonic acid passes from the blood into the air-cells, and the oxygen passes from the air-cells into the blood.

Source of Animal Heat.—The chemical changes

in every part of the body caused by the union of oxygen with carbon, hydrogen and other elements of the blood and tissue is the source of animal heat, which is generated in every part of the body, and is incessantly being produced.

THE NERVOUS SYSTEM.

Nervous System.—The nervous system is that part of the animal organism by which the different parts of the body are controlled and caused to work together, and through which mind and body are connected. The organs of the nervous system are the brain, the spinal cord, the nerves, and the ganglia of the nerves. There are two kinds of matter in the nervous system, the white and the gray.

Nervous White Matter.—It consists of milk-white, glistening fibers, sometimes less than one twenty-five thousandth part of an inch in diameter; these fibers are the conductors of nervous power.

Nervous Gray Matter.—It is made up of small, ashen-colored cells, forming a pulp-like substance, which is the generator of nervous power.

Nervous Force. –It is not known what it really is. It is like electricity in some respects, and in others it is very different.

Ganglia.—They are masses of gray nervous matter, sometimes called nerve centers; they correspond to the telegraph stations, and the nerve fibers to the wires.

Brain.—It is the great center of the nervous system, and the seat of the mind; it is egg-shaped, with the smaller portion in front; it weighs something more

than three pounds in the average, and is securely lodged in a strong bony case, and is covered with three membranes, and is surrounded by fluids. The names of the membranes are: 1. The **Dura Mater,** which is the outer one, 2. The **Arachnoid,** which is the middle, and 3. The **Pia Mater,** which is the one on the surface of the brain. About one-sixth of all the blood in the body is sent to the brain, although its weight is only about one-fortieth of the body. It is not a sensitive organ, as it may be cut, burned, or electrified without producing pain.

Cerebrum.—It is the first and upper part of the brain; it is sometimes called the great brain, and in the main comprises about seven-eighths of the entire weight of the brain; it is divided into two parts by a deep fissure or cleft running from the front to the rear; these are called right and left hemispheres. Each hemisphere of the cerebrum is divided into three lobes, called the frontal, middle and posterior lobes, the frontal being the largest. There is a small offshoot from the frontal lobe called the Olfactory. The cerebrum is the center of thought.

Convolutions.—Each lobe of the cerebrum has on its surface many tortuous and complicated elevations, called convolutions; these give the surface a curiously wrinkled and folded appearance. It is found that the higher the mental development the more complicated and unsymmetrical are the convolutions, and the deeper the depressions between them.

Sulci.—They are the winding fissures or depressions between the convolutions.

Cerebellum.—It is the back and lower part of the brain; it is sometimes called the Lesser Brain, and it is supposed to be the controller of muscular move-

ments. It is somewhat smaller than the closed hand.

Spinal Cord.—Is the nervous matter in the cavity of the back-bone, it is composed of white nervous matter cn the outside, and gray within; it is nearly cylindrical, and is divided by a fissure into two parts, one for each side of the bcdy.

Medulla Oblongata.—The upper and enlarged part of the spinal cord is the medulla oblongata, connecting the cord with the brain, it is the most exquisitively sensitive portion of the whole nervous system.

Nerves.—They are glistening, silvery threads, composed, like the spinal cord, of white and gray matter, There are two kinds of nerves called the Motory and Sensory; those which carry the dictations of the mind to the different organs are called motory; those which carry impressions from the different parts of the body to the brain are called sensory. There are three classes of nerves,—the spinal, the cranial, and the sympathetic.

Spinal.—They are thirty-one pairs of nerves which issue from the spinal cord through apertures in the back-bone. Each spinal nerve has two roots, by which it is attached to the spinal cord; the one attached to the front part of the cord is the motor root, and the one attached to the back part is the sensory root.

Cranial.—Twelve pairs of nerves springing from the lower part of the brain and the medulla oblongata.

Sympathetic.—They are the nerves cf organic life; they run from the gánglia, on each side of the backbone, to the heart, lungs, stomach, etc., and also to the spinal and cranial nerves. The sympathetic system controls the involuntary muscles, and the blood supply to the tissues, the nutrition of the body, and the secreting and excreting organs.

Pneumogastric is the nerve which passes from the medulla oblongata to the stomach, liver, and lungs, and controls the process of breathing. The origin of this nerve in the medulla oblongata is the mcst fatal spot in the nervous system; the least injury at this point causes instant death.

Sensorium.—That part of the brain which is the seat of sensation.

Nutrition.—The nervous system is dependent on the blood for the repair of its waste matter, hence, faulty nutrition and impure blood result in nervous weakness. A healthy brain needs nutritious food, pure air, a good digestion, and a proper alternation of exercise and rest.

THE SICK ROOM.

Air.—Air must be furnished every moment or we die. The vital element of the atmosphere is oxygen gas, this is a stimulating, life-giving principle. In the delicate cells of the lungs, the air we have inhaled gives up its oxygen to the blood, and receives in turn carbonic acid gas and water, foul with waste matter, which the blood has picked up in its circulation through the body, and which is exhaled by us. In the process the blood changes from purple to red.

The Impurities of a Sick Room consist largely of organic matter, which not infrequently bears the specific poison of the disease. On uncovering a scarlet fever patient in the direct rays of the sun, a cloud of fine dust may be seen to rise from the body—*contagious dust*, that, in unventilated localities is but slowly dispersed or destroyed, and which for many days retain its poisonous

qualities. **The effect of re-breathing** the air cannot be over-estimated; we take back into our bodies that which has been just rejected, the blood thereupon leaves the lungs, bearing not the invigorating oxygen, but a gas and effete matter which at the best is disagreeable to the smell, injurious to the health, and may contain the germs of disease.

One not very strong, or unable powerfully to resist conditions unfavorable to health, and with a predisposition to lung disease, will be sure sooner or later, by partial lung starvation and blood poisoning to develop pulmonary consumption.—"Ten Laws of Health."—*Black.*

Ventilation.—Taking the fresh external air as the standard of purity required for health, the object of ventilation is to conduct it through dwellings, hospitals and places of similar character, in a manner that, without inconvenience to the inmates, shall accomplish the rapid and thorough dilution and removal of whatever impurities their atmosphere contain. To do this effectively, and without risk to the health and comfort of the persons present, the ventilation must conform to certain indispensable conditions—viz.:

1. The air which enters must itself be pure.
2. It must be in sufficient quantity.
3. Its movements must be imperceptible.
4. It temperature must be suitably regulated.

Methods of Ventilation.—There are fortunately several ways of ventilating a room by which a window can be opened, with less risk of a draught, than when opened in the ordinary way.

4. For example the lower sash may be raised to the extent of three or four inches and made to rest upon a plain bar of wood, an inch in thickness, extending the whole breadth of window, so as to accurately close the the opening beneath the sash, by this means the

current of air, instead of passing directly into the room at lower part part of window, enters only at middle, where lhe lower sash, overlapping the end of the upper one, direct it upward toward the ceiling, whence it becomes gradually diffused through the room as in Figure 1.

FIG. 1.

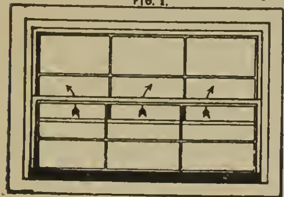

FIG. 2.

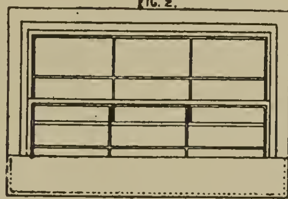

FIG. 3

2. Still simpler and equally effectual, is Dr. W. W. Keen's arrangement—placing with tacks or pins (preferably the former, using loops of tape, which can be taken off and replaced as wanted), a piece of cloth or paper across the lower ten or twelve inches of the window frame, and then raising the lower sash more or less, according to the weather, as in figure 2.

3. An excellent method was in use, some years ago, in the temporary building occupied by the Episcopal Hospital of Philadelphia. A pane was removed from each of the windows in a ward, and in its place was introduced a piece of zinc, perforated with a number of small holes. Wire gauze will do about as well. This allows the air to come in slowly, without draught, and moreover, it *tempers* it, by the conducting power of the metal.

If the air cannot be warmed, it must not be admitted at bottom of the room; it must be let in above, about 9 or 10 feet from the floor, and be directed toward the ceiling, so that it may pass up and then fall and mix gradually with the air of the room.

Motion of Air.—*Air, like water, to keep pure and fresh, must be in motion. Air, when confined, in a very short time, from the germs that all air seems to contain, to a greater or less extent, will foul itself by the birth, life, death and decomposition of animalcules, and soon loses its vitalizing power.—"Parke's Hygiene."*

Room.—The best room for a sick person is on the sunny side of the house, and which has an open fireplace in it, and at least two windows, full size. If fireplace is closed with a fireboard, newspaper or other obstruction, the nurse should at once remove it, as the open fire gives the glowing, comforting, radiant heat, and supplies ventilation by its upward draught into the chimney.

Light.—The influence of the sun's rays upon the nervous system is very marked. It is said also to have the effect of developing red disks in the blood. All vigor and activity come from the sun. An infant kept in absolute darkness would only grow into a shapeless idiot. That room is the healthiest to which the sun has freest access, and the room should be kept looking bright and cheerful.

Warmth.—For a sick chamber 68° Fahr. In summer when air is dry, place some thin muslin soaked in ice water across opening in windows, which will moisten air before being diffused through room, and will also prevent entrance of particles of coal or other powders which may be floating in the air.

Stationary Basins.—If there is a stationary basin in the room, put in the plug and fill the basin full of water, which must be changed from time to time, and never empty anything into it or use it in any way.

Floor.—The only clean floor is a floor planed, saturated with drying linseed oil, well rubbed, stained

(for appearance), not too dark, so as to hide the dirt, and beeswaxed with turpentine, and polished. The floor is to be wiped with a damp cloth and dried with a floor brush, or cleaned by a brush with a cloth tied over it, anything offensive spilled to be washed off at once with soap and water.

Carpets.—When called on to nurse a patient and find a carpet in the room do not try to remove it, cover it over with some sheets and occasionally sprinkle with carbolic acid, the sheets can be changed as often as desired or necessary.

Walls.—The only clean wall is the one that is painted; from this you can wash the animal matter which is what makes a room musty. The worst wall is a papered one, and the next is a plastered, but the plaster can be made safe by frequent lime washing and occasional scraping.

Furniture.—As little as possible in the sick room; all should be of polished wood, metal or marble, kept clean by being wiped with a cloth wrung out of hot water. A small light table with a drawer in it should be placed for the patient's use, to hold a glass of ice water or some cracked ice.

Bed.—The bed must never be placed with one of its sides against the wall, as a nurse must be able to attend to his patient from either side; the best beds are those with wire springs (called rheocline springs), which are permeable by the air up to the very mattress, which is a thin hair one, the bed not to be over three and a half feet wide. It should be placed in lightest spot in the room and patient should be able to see out of window.

Water Bed.—Called also the hydrostatic bed, or floating mattress. It is well known that the life and

health of every part of the animal body depend on the sufficient circulation through them of refreshed blood. Now, when a person in health is sitting or lying, the parts of the flesh compressed by the weight of the body do not receive the blood so copiously as as at other times, and if from any cause the action of the heart has become weak, the interruption will both follow more quickly and be more complete. A peculiar uneasiness soon arises where the circulation is thus obstructed, impelling to change of position, and the change is made as regularly and with as little reflection as the winking of the eyes to wipe and moisten the eyeballs.

A person weakened by disease, however, while generally feeling the uneasiness sooner, as explained, and becoming restless, makes the changes with increasing fatigue; and should the sensations become indistinct, as in the delirum of fever, in palsy, etc., or should the patient have become too weak to obey the sensation, the compressed parts are kept so long without their natural supply of blood, that tbey lose their vitality, and become what are called sloughs or mortified parts. These, if a patient survives, have afterwards to be thrown off by the process of ulceration, (see the inflammation process, page 198), leaving deep hollows to be filled up by new flesh during a tedious convalescence.

Uses.—It was to mitigate all, and entirely to prevent most of the evils attendant on the necessity of remaining long in a recumbent posture that the water bed was devised. A person rests on it as a water-fowl does on its bulky feathers, with as little inequality of local pressure as if in a bath.

Description.—They are made of rubber, in the

shape of a mattress, the water-bed is connected by a hose with a hydrant and the water with which it is filled should be at a temperature of 70° Fahr., and should be renewed every two weeks. The water-bed would be too heavy for an ordinary bed-spring, so there is a wooden trough used for it to lie in.

Air-Bed.—An air-bed consists of a sack in the shape of a mattress, divided into a number of air tight compartments, a projection at one end forming the bolster; each compartment is provided with a valve, and can be inflated by means of a bellows. Its advantages are coolness, elasticity and portability.

Flowers in the Sick Chamber.—It is a popular prejudice that plants and flowers should not be tolerated in the sick chamber, "because they give off carbonic acid gas, which is poisonous." So they do give off this gas, and the gas is poisonous, but the quantity of carbonic acid gas given off from half a dozen bunches of flowers in half a dozen nights would scarcely equal the amount of the same gas given off from a couple of bottles of mineral water.

How to make a Bed for long Occupancy.—In severe cases of illness, the mattress must be protected by rubber cloth, then comes the under sheet, then a draw sheet, which is simply a sheet folded in two and laid across the bed under the patient, and well tucked in; this draw sheet can be easily removed and changed with very little disturbance to the patient, and is necessary also to protect him from the heating effects of the rubber cloth, which if too near the person promotes weakening perspiration. It will often be necessary to put a second rubber cloth between the under sheet and draw sheet, to keep the under sheet dry and clean and free from the various discharges.

How to Change Cloths of Bed.—Fold the under sheet, then remove soiled one with the same motion which puts on a fresh one, it must first be warmed and aired, then half of it should be folded up small and flat through its whole length; lay the folded part next and close to the patient, pushing before it the soiled undersheet folded in the same way. Press down the mattress close to the patient, and gently work the two folds, the soiled and the clean one, under the back and shoulders; the head and feet can be slightly raised to allow the folds to pass, this done you have only to pull the sheet smooth and tuck it in.

How to Change Upper Sheet.—Air and warm the sheet, and then roll it in its width; pass it under the sheet which you are to change, commence at foot of bed and bring it up as smoothly as possible, unrolling it as you move it up; when it is well over your patient draw down the soiled sheet, and remove it at foot of bed. In this way you do not remove any of the blankets, and so avoid chilling the patient.

How Pillows Should be Placed.—Place them so as to raise the head and support the shoulders, and give the lungs fair play; in propping up a patient, see that a pillow is pulled well down into the small of the back, commence with that pillow, and put the others each one between the last, this will keep them from slipping. Wooden **bed rests** are made, and for temporary use, a straight back chair, turned, can be used.

Bed Frames.—It is often necessary to keep the upper clothes well off the patient. In cases of fractured legs, or in any other condition where the legs are immovable, it is always advisable to prevent the sheets from resting on the tips of the toes. This is managed without difficulty by means of the ordinary

bed-frame, which is a very simple contrivance. Whenever a bed-frame or any similar contrivance is employed great care should be exercised that the patient's body does not get chilled by draught; he should be closely covered up with a blanket down to the point where cradle commences.

Bed Table upon which patient's dinner may be placed, or which they may either use for reading or writing, are to be had in great variety, the one designed to stand upon the bed, the legs being placed on either side of the patient's knees, is so simple in construction, and so easy to comprehend, that any village carpenter would find but little difficulty in manufacturing something which at least would answer the purpose.

PREPARING AND SERVING OF DELICACIES.

Diet.—Is food viewed collectively; a patient's diet usually means his food administered, on some regular principle, by the physician's directions. Health demands that our food proper should be like our food for the lungs, good. The demand unfortunately is too often unheeded or misinterpreted. We all realize the necessity of food in some form. Every step we take, the slightest movements of our body, are associated with a certain amount of loss of tissue, which must be replaced. Our bodies too, have constantly to withstand the contact with the colder atmosphere, which continually tends to lower the essential temperature of health. Food makes up for the waste resulting from the wear and tear, and supplies the heat that is required to keep our bodies at the normal temperature

Viewed therefore as fulfilling these two conditions it is commonly divided into—1, **tissue forming**, and 2, **heat producing**,— some parts of our food being devoted more to the one object, and the other parts to the other.

Classification.—Food considered in itself has been classified in many ways. A common one and employing simple terms, is into the following four groups:

1. The albuminous or fibrinous. 2. The oleaginous or fatty. 3. The saccharine or sugary. 4. The aqueous.

Albuminous.—This class includes the constituents of our food that are chiefly tissue forming, *i. e.*, forming muscles, and supplying generally what is lost, by bodily wear and tear; it is represented in the meat by the lean, in an egg by the albumen or white, in bread by what is called gluten, and so on.

Oleaginous.—This class includes food which are generally heat-producing, viz.: Animal fats and vegetable oils; such foods are instinctively taken in large quantities in northern regions, and we find that cod liver oil, for example, is better borne in winter than in summer.

Saccharine.—This includes not merely all forms of sugar, but the closely allied starchy constituents of food, which are very readily changed into sugar. They form the greater part of vegetable foods, e. g., fruits, grains, roots, etc. This class like the oleaginous is chiefly heat-producing.

Aqueous.—This is hardly entitled to be called a class; it includes the water that is to be found to some extent in all food products, along with various salts held in solution.

What kind of food to be given in each case, will usually be decided by the physician; how best to prepare and administer it, are matters for the nurse to

know; everything should be the best of its kind, well cooked, palatably seasoned, and attractively served; have hot things very hot, and cold ones really cold. A weak digestion cannot manage a load, but must take little and correspondingly often; ascertain from the doctor, how much he wishes the patient to take within the twenty-four hours and dividing it up into suitable quantities, serve it at regular intervals.

How to Serve Food to the Sick.—In all cases where the patient is too ill or forbidden to sit up in bed, a feeding cup, with a curved spout, should be used, a clean towel having previously been pinned around the neck, should the head need raising. The nurse's hand should be passed beneath the pillow, and the head and pillow gently raised together. Where there is extreme prostration, a glass tube bent at right angle; of which one end is placed in the vessel containing the food, and the other in patient's mouth, will enable the food to be sucked up with scarcely any effort.

How to Serve Food to the Delirious.—If the patient is in a state of delirium or coma endeavor to rouse him somewhat before giving him his food; sometimes merely putting the spoon in his mouth is enough, at other times you will require to get it well to the back of the tongue, in such cases watch carefully to see that the liquid is swallowed, before attempting to give a second spoonful. It may be difficult for you sometimes to know whether or not a patient should be roused in this way to take his food, because he may be sleeping actually; if in any case you feel a difficulty in this respect you must ask for special in struction.

How to Serve Food to the Convalescent.—Serve

food on a tray covered with a fresh napkin, have cups and spoons shiningly clean, be careful not to slop the tea into the saucer, and that all necessary things are on the tray, when brought to the patient; if you are obliged to leave it for a moment, to go for something else, never set it on the bed, but on the table. Never taste a patient's food in his presence; take away tray from room as soon as meal is ended. After feeding always dry the mouth, especially at the corners, if the patient cannot well do it himself, The lips not infrequently become sore from want of this little care.

To provide food for the sick which will be at once suitable and acceptable is a matter which requires care, judgment and ingenuity, but it is well worth the expenditure of them all. The aim should be to give what will be at once easy of digestion, and of value after it is digested.

The following receipts are simple enough to be used successfully by the least experienced in the culinary art.

Essences.

Beef Essence. No. 1. (Time about 3 hours.)—One pound of lean juicy beef, half a saltspoonful of salt. Mince the meat, put it into a wide-mouthed bottle or fruit jar, cover tight, and set in a kettle of cold water over a slow fire; boil three hours; stir well, strain, and add the salt, when cold remove every particle of fat.

N. B.—In rewarming beef essence or tea never heat it beyond the point at which it is required for use.

Beef Essence. No. 2. (Time about 3 hours.)—One pound of lean juicy beef, half a saltspoonful of salt. Mince the meat, put in an earthenware jar, with a

tight cover, place the jar in a moderately hot oven, and let it remain three hours; stir it well, strain through a sieve, and add the salt, when cold remove all fat.

Beef Essence in haste. (Time about 6 minutes). One pound of steak, cut from top of the round, half a saltspoonful of salt. Remove every particle of fat and skin from the steak. and mince the meat fine. Put it in a dry stew-pan over a slow fire, and let the juice ooze from it about six minutes, stirring all the time to prevent sticking; strain, add the salt, and serve either hot or cold.

Beef Juice. (Time about 20 minutes).—One pound of lean juicy beef, half a saltspoonful of salt. Place the meat on a broiler over a clean hot fire, and broil until heated through, squeeze the juice into a hot cup and add the salt. Serve hot with toast or crackers.

Oyster Essence. (Time about 10 minutes).—Half a pint of oysters, one saltspoonful of salt. Wash and drain the oysters, cut them into small pieces, and put them in a stew pan over a slow fire, simmer until all the juice is extracted, then strain, add the salt, and serve hot with toasted crackers.

Beef Teas.

Beef Tea. No. 1. (Time about 12 minutes).—One pound of lean juicy beef, half pint of cold water, one saltspoonful of salt. Mince the meat, put into stew pan with the water and salt and soak one hour. Cover closely and simmer very gently ten or twelve minutes, stir well, strain, and set aside to cool, when cold remove all the fat. This should be kept in a very cold place, and heated only in quantities required for immediate use.

N. B.—If required in haste, the soaking may be omitted.

Beef Tea.—No. 2. (Time about 1 hour).—One pound of lean juicy beef, one saltspoonful of salt, half a pint of warm water. Broil the meat over a clean hot fire until it is heated through, then put in a bowl, sprinkle the salt over it and add the water; cover closely, and keep hot (but do not boil), one hour. Strain and serve hot, with toast or unleavened wafers.

Raw Beef Tea. (Time about 2 hours).—One pound of lean steak, from top of the round, half a saltspoonful of salt, half a pint of cold water. Mince the meat, put it in a bowl with the salt and water, and let it soak two hours, squeeze through a meat or lemon squeezer and drink the juice ice cold.

N. B.—This should be served in a claret colored glass, as the sight of blood will sometimes nauseate the patient.

Beef Tea with Oatmeal or Rice. (Time, 10 or 15 minutes).—One pint of beef tea No. 1, two tablespoonfuls of cooked oatmeal or rice, four tablespoonfuls of boiling water. Put the beef tea into a saucepan, and heat to the boiling point, blend the oatmeal with the boiling water and stir it into the beef tea, and a little salt and a shake of black pepper, if desired, serve hot with toast or crackers.

Broths.

Beef Broth. (Time, 1 hour).—One pound of lean juicy beef, one pint of cold water, half a teaspoonful of salt. Mince the meat, put it into a stew pan with the water and salt, and boil slowly one hour, strain, add a shake of black pepper, if allowed, and serve hot with strips of dry toast.

Mutton Broth. (Time, 2 hours).—Two pounds of lean juicy mutton, one quart of cold water, one teaspoonful of salt.—Remove every particle of fat and skin from the meat, then cut it up, put it into a stew-pan with the water and salt, and boil slowly an hour and a half. Strain, and set away to cool; when cold remove all fat and dregs, and heat as required for use.

Chicken Broth. (Time 2 hours.)—Three pounds of tender chicken, two quarts of cold water, two scant teaspoonfuls of salt. Skin the chicken (if it is very fat), cut it up, pound the pieces with a mallet until the bones are broken. Put it into a stew-pan with the water and salt, and boil slowly two hours; strain, and set aside to cool, when cold remove all fat and dregs and heat as required for use.

Soups.

Stock for Soups. (Time 6 hours).—Two pounds of the shin of beef, two pounds of round or shoulder steak, two quarts of cold water, two teaspoonfuls of salt. Wash the meat, put it into a soup kettle with the cold water and salt, bring slowly to a boil and skim, then let it simmer until the meat is ready to drop to pieces; strain, and set the stock aside to cool; when cold remove all fat and dregs.

This should be kept in a cold place, but not where it will freeze, and used, when required, for the foundation of soups.

Chicken Soup. (Time about 20 minutes).—One pint of chicken broth, two tablespoonfuls of cooked rice, one-fourth of a teaspoonful of chopped parsley, a light shake of black pepper. Put all the ingredients into a stew-pan and simmer together twenty minutes. Serve hot with dry toast or unleavened wafers.

Mutton Soup. (Time 2 hours).—One pound of lean juicy mutton, one quart of cold water, one teaspoonful of salt, one tablespoonful of uncooked rice, one teaspoonful of chopped parsley, shake of black pepper. Remove every particle of fat and skin from the meat, put it into a stew-pan with the water and salt, boil thirty minutes and skim. Add the rice, parsley and pepper, and boil slowly one hour and a half. Remove the meat and serve the soup very hot, with toast or crackers.

Toast Soup. (Time, 10 minutes).—Two tablespoonfuls of toast crumbs, one-fourth of a pint cf boiling water, half a pint of boiling stock, a shake of pepper. Soak the crumbs in the boiling water two minutes, add the stock, and simmer slowly eight minutes. Season with a light shake of pepper, and serve hot, with dry toast or crackers.

Macaroni Soup. (Time, 1 hour).—Half a stick of macaroni, quarter pint of cold water, half a pint of boiling stock; a light shake of black pepper.

Soak the macaroni in the water, ten minutes, and simmer in the same thirty minutes, then cut it into small pieces and drop them into the boiling stock, add the pepper, stew gently ten minutes, serve hot.

Rice Soup. (Time, 6 or 8 minutes).—Two tablespoonfuls of boiled rice, one pint of boiling stock, the yolk of half an egg well beaten, four tablespoonfuls of sweet cream.

Rub the rice through a wire sieve into the boiling stock. Simmer two minutes and remove from the fire. Beat the egg and cream together, and pour it into the stock, stirring all the while to prevent curdling. Heat to the boiling point, add a shake of pepper if desired, and serve at once.

Oyster Soup. (Time, 20 minutes).—One pint of oysters, half pint of cold water, half teaspoonful salt, one teaspoonful of butter, one teaspoonful cracker flour, three tablespoonfuls cream, shake black pepper, six fine whole oysters.

Cut the pint of oysters into small pieces, put them into a stew-pan with the water and salt, and simmer ten or fifteen minutes, skim well and strain. Rub the butter and cracker flour to a smooth paste; blend enough of the broth with it, to make it the consistancy of cream, and pour it into the boiling broth, add the cream, pepper, and whole oysters. Boil up once and serve hot with crackers.

Beef Soup, in haste. (Time, about 40 minutes).—One pound of lean steak, pint of cold water, half a teaspoonful of salt, a piece of celery two inches long if desired, two tablespoonfuls of cooked rice, one tablespoonful of toast crumbs, shake black pepper.

Mince the meat, put it into a saucepan with the water, salt, and celery, and boil slowly thirty minutes, add the rice and toast crumbs and boil fifteen minutes longer. Take the meat and celery out, pour the soup into a bowl, and shake a very little of pepper over the top, serve hot with crackers or toast.

Toasts.

Dry Toast.—Toast should be made of very light bread, at least twenty-four hours old. Cut the bread into slices about three-quarters of an inch thick, and toast slowly over a clean fire—turning frequently that it may heat through before it begins to brown; when a delicate brown on both sides, cut the crust edge off and butter sparingly, serve hot as possible.

Water Toast. (Time, 5 minutes).—One slice of

bread, a piece of butter the size of a chestnut, half a saltspoonful of salt, five tablespoonfuls of boiling water.

Toast the bread to a rich brown on both sides, and spread the butter evenly over it, lay it on a hot plate, sprinkle over the salt, and pour on the boiling water. Serve between hot plates.

N. B.—A teaspoonful of sugar, and a grate of nutmeg over the toast make a pleasant change.

Cream Toast. (Time, 10 minutes).—One piece of bread, half a saltspoonful of salt, four tablespoonfuls of boiling water, one tablespoonful rich cream.

Toast the bread to a rich brown on both sides, and lay it on a hot plate, dissolve the salt in water, and pour it over the toast, when it is all soaked up, spread on the cream, serve between hot plates.

Cracker Toast. (Time, 5 minutes).—Three water crackers, one teaspoonful of butter, half a saltspoonful of salt.

Split, and spread the crackers with butter, sprinkle over with the salt and pour on as much boiling water as they will absorb, then put them carefully on a thin plate, place it on the rack in a brisk oven and let it remain five minutes, serve at once.

Poached Eggs on Toast. (Time, 6 minutes).—One quart boiling water, one teaspoonful, two eggs, a shake of black pepper.

Put the water and salt into a well greased frying-pan, break the eggs into a saucer, and slip them carefully into the water while boiling. Do not boil again but allow the eggs to remain in the water until the white is set, and the yolk is as much cooked as is desired, take them out carefully, so as not to break the yolks, lay them on thin slices of slightly buttered

toast, and shake a very little black pepper over them.

Omelet.

Omelet. (Time about 6 minutes).—Yolk of one egg, tablespoonful of sweet milk, third of a teaspoonful corn starch, half a saltspoonful salt, a light shake of pepper, whites of two eggs.

Beat the yolk of egg until it is light, add the milk, corn starch, salt and pepper, and stir until all are well blended. Beat the whites of two eggs to a stiff dry froth, and stir it lightly into the yellow, heat a frying pan (about size of a small tea plate), grease it lightly with butter, and pour the omelet mixture into it, cook slowly until it is "set," then cut across with a knife, fold, serve at once.

Panadas.

Chicken Panada. (Time, 6 hours).—One full-grown tender chicken, three pints of hot water, teaspoonful salt, pepper or nutmeg.

After the chicken has been well cleaned, and allowed to cool, put it (whole), into a kettle with the water and salt, and boil slowly until it is well done, but not so that it will drop to pieces, take chicken out of broth and set both away for three or four hours to cool. Then remove skin from the white meat, cut it up, put it into a mortar, with two tablespoonfuls of the broth (free from fat), and pound it to a smooth paste, add as much broth as will make it thin enough to drink as you would soup. Boil up once, season with very little pepper or nutmeg, and strain through a fine sieve, serve hot with toast or unleavened wafers.

N. B.—Be careful to remove every particle of fat from the broth, before it is added to the paste. If

desired richer, stir in two tablespoonfuls of cream; if too rich, dilute with boiling water.

Toast Panada. (Time, 15 minutes).—One slice of lightly buttered toast, two teaspoonfuls of sugar, half a saltspoonful of salt, four tablespoonfuls of brandy or rum, half pint boiling water, nutmeg.

Cut the toast into small squares and put them into a hot bowl, sprinkle the sugar and salt over, add the brandy, and pour on the boiling water, grate a little nutmeg over the top; serve at once.

Gruels.

Oatmeal Gruel. (Time, 30 minutes).—One quart boiling water, half pint medium oatmeal, half teaspoonful salt.

Pour the boiling water over the meal, stir it well and strain through wire sieve. Boil the liquid which is strained off until it thickens and looks clear, if too thick, add the boiling water until it is of the desired consistency, add the salt, and, if allowed, two tablespoonfuls of sweet cream, which will greatly improve taste.

Cornmeal Gruel. (Time, 2 hours).—One tablespoonful cornmeal, quart of boiling water, saltspoonful of salt.

Sprinkle the meal into the water while boiling, stirring all the while to prevent lumps, add the salt and simmer slowly two hours, if too thick, thin it with boiling water.

Rice Gruel. (Time, 2 hours).—Two tablespoonfuls rice, six tablespoonfuls cold water, one and a half pints new milk, one teaspoonful sugar, half a teaspoonful salt.

Wash the rice thoroughly, and soak in cold water one hour, put it in a double kettle with the milk and simmer until the rice is well done, then pulp it through a wire sieve, and add the sugar and salt.

Farina Gruel. (Time, 30 minutes). —One tablespoonful of farina, one pint of boiling water, half a saltspoonful salt.

Sprinkle the farina into the boiling water, stirring all the time to prevent lumps, add the salt and simmer slowly half an hour. A teaspoonful of cream will improve the taste of the gruel, and, if allowed, should be stirred in just before it is removed from the fire.

Flour Gruel. (Time, 30 minutes). —Mix a tablespoonful of flour with milk enough to make a smooth paste and stir it into a quart of boiling milk. Boil for half an hour, being careful not to let it burn, salt and strain.

Liquids.

Milk.—As this liquid contains all the elements necessary for complete nutrition, it has been regarded as the type of composite foods, but it is only completely adapted to a certain stage of animal life. In cities milk is often adulterated with water. If much water has been added, it may be detected by applying the specific gravity test; the specific gravity of unadulterated milk ranges from 1.026 to 1 033, the average is about 1.030, two parts water to eight parts milk, will reduce its specific gravity to 1.024, four parts of water to six parts of milk to 1.018. Good milk should be of a good full white color, perfectly opaque, without deposit, and free from any peculiar taste or smell. It should give a neutral reaction, and have a specific gravity of at least 1.028.

The following table sets forth at a glance the chemical composition of different varieties of milk:

Mean composition of the milk of various animals.

	WOMAN'S.	COW.	GOAT.	SHEEP.	ASS.	MARE
Caseine, cheesy matter and insoluble salts........	3.35	4.55	4.50	8.00	1.70	1.62
Fatty matter......	3.34	3.70	4.10	6.50	1.40	0.20
Sugar of milk and soluble salts.....	3.77	5.35	5.8	4.5	6.4	8.75
Water............	89.54	84.4	85.6	82.00	90.5	89.33
Total.........	100.00	100.0	100.0	100.00	100.	100.0

Milk Punch.—To half a pint of fresh cold milk, add two teaspoonfuls of sugar, and an ounce of brandy or sherry, stir till the sugar is dissolved.

Rum Punch.—Dissolve one teaspoonful of sugar in half pint of milk, stir in two tablespoonfuls of rum, and mix well by pouring from one glass to another twice.

Sherry Punch.—Put quarter pint of milk into a goblet, dissolve one teaspoonful of sugar in it, and add two tablespoonfuls of sherry wine.

Syllabub.—Dissolve two teaspoonfuls of sugar in a tablespoonful of wine, put it into a pint pitcher, and take it to the cow, milk into it till the foam reaches the top.

Hot Milk and Water.—Boiling water and fresh milk in equal parts, compose a drink highly recommended in cases of exhaustion, as it is quickly absorbed into the system, with very little digestive effort.

Egg Nogg. 1.—Beat the white of an egg stiffly, then stir into it in turn a tablespoonful of sugar, the yolk of an egg, a tablespoonful each of ice-water, milk

and wine; do not beat but stir very lightly.

Egg Nogg. 2.—Beat up one egg with a tablespoonful of sugar, stir into this a cup of fresh milk, an ounce of sherry, or half an ounce of brandy, and a little nutmeg.

Hot Egg Nogg.—Beat together the yolk of an egg and a teaspoonful of sugar, and stir into a pint of milk at boiling point, add a tablespoonful of brandy or whiskey, and grate a little nutmeg over the top.

Egg Water.—Stir the whites of two eggs into half a pint of ice-water, without beating, and add enough salt or sugar to make it palatable.

Egg Broth.—Beat together one egg and half a teaspoonful of sugar, till very light, and pour on a pint of boiling water, stirring well to keep it from curdling, add salt, and serve hot.

Lemonade, with egg.—Beat one egg with two tablespoonfuls of sugar, until very light, then stir in three tablespoonfuls of cold water, and the juice of a small lemon, fill the glass with pounded ice and drink through a straw.

Egg Flip.—Beat one egg and four teaspoonfuls of sugar together until stiff and light, pour half a pint of hot beer (not boiling), into it, stirring briskly to prevent curdling, and pour it from one bowl to another, to make it foamy and light.

N. B.—This is used when stimulant and nourishment are required, and should only be taken in small quantities, unless otherwise ordered by physician.

Lemonade No. 1.—Two tablespoonfuls of lemon juice, one tablespoonful of sugar, half a pint of ice-water, one tablespoonful pounded ice, two thin slices

of lemon. Put all in a large goblet, and stir until sugar is dissolved.

Lemonade No. 2.—Two tablespoonfuls of lemon juice, one tablespoonful of sugar, half pint boiling water. Put all ingredients into hot bowl, and stir until sugar is dissolved; drink it hot.

Flaxseed Lemonade.—Three tablespoonfuls of flaxseed, two tablespoonfuls of sugar, one pint boiling water, three tablespoonfuls lemon juice. Put the flaxseed and sugar into a pitcher, pour the boiling water over them, and steep on the back part of the stove one hour, strain, add lemon juice, serve cold.

Irish Moss Lemonade.—Quarter pint Irish moss, quart boiling water, six tablespoonfuls lemon juice. four tablespoonfuls sugar. Wash the moss thoroughly and let it soak in cold water ten minutes, then remove all imperfect parts, and any gravel that may adhere to it. Put it in a pitcher with all the other ingredients, cover closely, and steep on the back part of the stove two hours, strain through a wire sieve, serve either hot or cold.

Barley Water.—Wash two ounces of pearl barley in cold water, then boil for three minutes, and throw both waters away, add two quarts of boiling water and boil until reduced to one quart—or about 2 hours—stirring frequently, strain, add the juice of a lemon and sweeten.

Toast Water.—Toast three slices of stale bread to a very dark brown, but do not burn. Put into a pitcher, and pour over them quart of boillng water, cover closely, and let it stand on ice until cold, strain. A little wine and sugar. may be added if desired.

Apple Water.—Slice into a pitcher half a dozen juicy sour apples, add a tablespoonful of sugar, and pour over them quart of boiling water, cover closely until cold, then strain. (Slightly laxative).

Bran Tea.—To a pint of wheat bran, add a quart of boiling water, let it stand where it will keep hot (but not boil) for an hour, strain and serve with sugar and cream.

Corn Tea.—Parch brown a cupful of dry sweet corn, grind or pound it in a mortar, pour over it two cups boiling water, and steep for a quarter of an hour, then strain and add boiled milk and sugar.

Crust Coffee.—Take a pint of crusts—those of Indian bread are the best—brown them well in a quick oven, but do not let them bnrn, pour over them three pints boiling water, and steep for ten minutes, serve with cream.

Tea—Tea should be made in an earthen pot, first rinsed in boiling water. Allow a teaspoonful of tea to each half pint of water. Put in the tea, and after letting it stand for a few moments in the steaming pot, add the water, freshly boiling, and let it stand where it will keep hot, but not boil, from three to five minutes.

Coffee.—Stir together two tablespoonfuls of freshly ground coffee, four of cold water and half an egg. Pour upon them a pint of freshly boiling water, and let them boil for five minutes, stir down the grounds, and let it stand where it will keep hot, but not boil, for five minutes longer. In serving put sugar and cream in the cup first, and pour the coffee upon them.

Chocolate.—Scrape fine an ounce of chocolate, add

two tablespoonfuls of sugar, and one tablespoonful of hot water; stir over a hot fire for a minute or two, until it is smooth and perfectly dissolved, then pour into it a pint of boiling milk, mix thoroughly and serve at once. If allowed to boil after the chocolate has been added to the milk, it becomes oily and loses flavor.

Broma.—Made in same manner as chocolate.

Ice Cream.

Ice Cream No. 1.—One tablespoonful of Bermuda arrow-root, four tablespoonfuls of cold milk, half a pint of sugar, one quart of boiling milk, one pint of rich cream, six drops of any flavoring preferred. Blend the arrow-root with the cold milk, and strain through a double piece of bobbinet. Dissolve the sugar in the boiling milk (which should be in a double kettle) and pour the arrow-root into it, stirring gently to prevent lumps. Simmer until it thickens, and turn it into a dish to cool.

When cold stir in the cream and flavoring. Freeze.

Ice Cream No. 2.—One pint thick sweet cream, two tablespoonfuls of powdered sugar; whip the cream to a stiff froth, stir in the sugar, a little at a time, and flavor if desired. Put it into a freezer, packed in ice and salt, just as you would for other ice cream, do not stir it, but let it stand until frozen. If the weather is cold enough, it will freeze by leaving it out of doors. Time required about one hour.

N. B.—This is very rich and should only be taken in small quantities.

Peptonized Foods.

The researches of Dr. Roberts, of Manchester, have

given a great impetus to the employment of artificially digested food, or peptonized food, as Dr. Roberts suggests it should be called. He recommends Benger's preparation of the natural digestive ferments, a little of which requires to be added to the milk or gruel as the case may be, according to the following methods:

Peptonized Milk.—Dilute a pint of milk with a quarter pint of water and divide the mixture into two equal portions. Heat one portion to the boiling point, and then mix it with the cold portion (this is simplest way of getting what is wanted, a temperature of 140° Fahr.) Now add to this three fluid drachms of pancreatic solution—Liquor Pancreatis (Benger)—and about 20 grains of bi-carbonate soda, mix well together and set aside in a covered jug, in a warm situation under a "cosey" for an hour or an hour and a half. Then boil for two or three minutes and serve like ordinary milk.

Peptonized Gruel.—It may be prepared from oatmeal, wheaten flour, pearl barley, etc., and should be thick and strong and very well boiled. Allow the gruel to cool to a temperature of 140° Fahr. (just so hot that it can be sipped without burning the mouth), and then to every pint of gruel, add two teaspoonfuls of the pancreatic solution, and mix well together, pour the whole into a jug with a cover, and set it aside in a warm situation for about a couple of hours. Finally boil it for three minutes and strain.

Peptonized Beef Tea.—Mix half a pound of finely minced lean beef with a pint of water and twenty grains of bi-carbonate soda, and let the whole simmer for an hour and a half, when it has cooled down to

the temperature of 140° Fahr. add a teaspoonful of the pancreatic solution, and place the mixture in a warm situation for a couple of hours, stirring it from time to time, then strain off without pressure and boil the liquid for five minutes.

WEIGHTS AND MEASURES.

The weights and measures adopted by the U. S. Pharmacopœia are those which should always be employed when writing down orders. There is another system, however, viz., the Metric, which has many advantages peculiar to itself, and which is now coming into such general use, that an acquaintance with it is necessary to every practical nurse. The weights of the former system are derived from the Troy pound and are as follows:

Apothecaries', or Troy Weight.

Pound.		Ounces.		Drachms.		Scruples.		Grains.
lb.		℥		ʒ		℈		gr.
1	=	12	=	96	=	288	=	5,670.
		1	=	8	=	24	=	480.
				1	=	3	=	60.
						1	=	20.

Apothecaries', or Wine Measure.

Gallon.		Pints.		Fluidounces.		Fluidrachms.		Minims.
C		O		fl℥		flʒ		M
1	=	8	=	128	=	1,024	=	61,440.
		1	=	16	=	128	=	7,680.
				1	=	8	=	480.
						1	=	60.

Approximate Measures.

1 minim varies from	1 to 2 drops.
1 fluidrachm equals about	1 teaspoonful.
2 fluidrachms " "	1 dessertspoonful.
4 fluidrachms " "	1 tablespoonful.
2 fluidounces " "	1 wine glass.
4 fluidounces " "	1 teacup.

Medicines are sometimes ordered in drops instead of minims. As the size of the drop depends on a variety of circumstances, this is a bad practice, and should only be employed when an excess of the quantity intended would be harmless. Graduated medicine glasses are easily obtained, and are much more reliable.

The French or Metric System

has its unit the meter (39.37 inches), which is the ten-millionth part of the distance from the pole to the equator From this as a basis all other measures and weights are formed. The system is arranged on a decimal scale,—that is, all the divisions are connected by the multiple ten, in exactly the same way as the coins in the U. S. monetary system. The names given to the different divisions and multiples of the unit are formed in each case by a certain prefix, derived from the Latin or Greek, which is placed before the name of the unit. It is the custom in all countries where the metric system is used in writing preseriptions, to express all quantities by weight, fluids as well as solids being expressed in this way. We have only to do, then, with the *gramme*, and its decimal divisions, that being the name given to the unit of weight. A

gramme is the weight of *one cubic centimeter* of water at 39° Fahr. The subdivisions of the gramme are as follows:

1 gramme = weight of 1 c. c. water at 38° Fahr.	written	1.0
1 decigramme = 1-10 of a gramme,	"	0.1
1 centigramme = 1-100 of a gramme,	"	0.01
1 milligramme = 1-1000 of a gramme,	"	0.001

In practice, the decigram is disregarded, and everything expressed in terms *grammes* and *centigrammes*; in the same way as we disregard our dimes and express money values in terms of dollars and cents. In writing orders for solids, then, one has only to know the dose in terms of grammes, the mathematical calculation being practically the same as when the apothecaries weight is employed, only simplified by the use of the decimal system.

Table of Approximations.

Apothecaries'.	Grammes (nearly).	Grammes (exactly).
gr. 1	0.06	0.06479.
℈1	1.30	1.2958.
ʒi	4.0	3.8874.
℥i	31.0	31.103.

From the preceding table may be easily deduced the following rules for expressing quantity by weight of the apothecaries' system in metric terms.

RULE 1:—Reduce the quantity to grains and divide by 15; the quotient expresses the same quantity [nearly] in grammes.

RULE 2:—Reduce the quantity to drachms and multiply by 4; the product represents [nearly], the same quantity in grammes.

RULE 3:—Reduce each quantity to ounces and multiply by 31; the product represents [nearly], the same quantity in grammes.

In changing *fluid measures to grammes* the same rules may be employed to get results accurate enough for all practical purposes. But if greater exactness is required, it must be remembered that one gramme of water measures about 16 minims [exactly 16.231]; consequently, [1 fluidounce of water weighs 455·7 grains],—

1 minim	0 06 grammes,		exactly	0.0616.
1 fʒ	= 3 70	"	"	3.697
1 f℥	= 30.	"	"	29.575

MEDICINES.

The U. S. Ph. or the recognised Materia Medica standard of the American physician, and which also is best for nurses to be made acquainted with, is divided into the materia medica list and the preparations.

Materia Medica list is an enumeration of drugs.

Preparations are various forms of those drugs, made by the apothecary, ready for immediate exhibition.

Solids:—The following are the officinal preparations.

Pilulæ (Pills).—Small globular masses, intended to be swallowed without chewing. Large doses and deliquescent salts should not be exhibited in this form. A pill should not contain more than three or four grains of a vegetable, or five or six of a mineral substance. They are coated with sugar or gelatine to disguise their taste.

Pulveres (Powders).—Medicines which are not too

bulky, too disagreeable, nor too acrid, are exhibited in this form. The objection to powders is their liability to deterioration and adulteration. They may be administered in syrup or dry in sugar.

Trochisci (Lozenges).—Little tablets which are intended to be slowly dissolved in the mouth. They are generally made with tragacanth and sugar.

Confectiones (Confections).—Soft solids made with sugar.

Extracta (Extracts),—Are prepared by evaporating the expressed juice, decoction, or infusion (watery extracts), or of the tincture (alcoholic extracts). They are usually administered in pills.

Resinæ (Resins).—These are the active resinous principle of drugs, obtained by precipitating their tinctures with water.

Suppositoria (Suppository).—These are little cones made of some substance, which melts at the temperature of the body, intended to be inserted in the rectum. They are usually made of cocoa butter, and wax.

Unguenta (Ointments).—Soft solids, melting at or near the temperature of the body, intended to be used by inunction.

Cerata (Cerates).—Moderately soft substances, intended for external application, capable of being spread at ordinary temperatures, but not melting with the heat of the body. They usually contain wax.

Emplastra (Plasters).—Solid substances, becoming more or less viscid, at the temperature of the body, spread on muslin, skin, linen, or some similar material, and designed for external application.

Chartæ (Papers).—Medicated papers for external

application, such as chartæ cantharides. Brief immersion in warm or tepid water should precede the use of the paper, either of cantharides or of mustard.

Liquids.

Decocta (Decoctions). — Watery preparations of crude vegetable substances, made by boiling.

Infusa (Infusions).—Watery preparations of crude vegetable substances, made with either hot or cold water, without boiling.

Liquors (Solutions).—Solutions in water of non-volatile substances (Liquor calcis).

Aquæ (Waters).—Solutions in water of volatile substances (Aqua ammonia).

Misturæ (Mixtures).—These consist of one or more insoluble substances suspended in water by means of gum, or other similar material. When the dissolved principle is an oil, the mixture is called an emulsion.

Mucilagines (Mucilages).— Aqueous solutions of gummy or mucilaginous substances.

Linimenta (Liniments).—Oily or soapy solutions, intended for external use, generally rubefacients.

Tincturæ (Tinctures).—These are alcholic solutions of non-volatile substances.

Spiritus (Spirits).—Are alcoholic solutions of volatile substances.

Vina (Wine).—These are *solutions* in wine.

Oleoresinæ (Oleorsins).—Concentrated semi-solid preparations, consisting of a resin and volatile oil combined.

Olea Destillata (Distilled oils).—Volatile oils obtained by distillation.

Extracta Fluida (Fluid extracts).—These are con-

centrated fluid preparations, in most instances, of such a strength, that a fluid ounce represents a troy ounce of the crude drug. They are generally made by evaporating a tincture or infusion, sugar frequently being added as a preservative.

Succi (Juices).—Very concentrated preparations, each of which is made by the addition to every five measures of the fresh juice, one measure of alcohol.

Syrupi (Syrups).—Preparations in which is sugar

Mellita (Honey).—Solutions in honey.

Glycerita (Glycerites).—Solutions in glycerine.

ADMINISTRATION OF MEDICINES.

Medicines may be introduced into the circulation by various routes, as the gastro-intestinal tract, the rectum, the respiratory tract, the veins and arteries, the subcutaneous cellular tissue, and the integument itself.

Gastro-Intestinal Route is the one most frequently employed, being the most convenient. The remedies after being swallowed, find their way into the current of circulation, through the walls of the gastro-intestinal blood-vessels and the lacteals. When the stomach is empty and its mucous membrane healthy crystalloidal substances in solution pass through the walls of its vessels with great rapidity.

The Rectum will absorb many substance applied in the forms of enemata or suppositores. Those most suited to this route are the salts of the alkaloids in solution, especially those of morphine, atropine and strychnine, the latter being absorbed more rapidly per rectum than by stomach.

The Respiratory Tract admits of the rapid absorp-

tion of medicinal substances through its extensive blood supply. The inhalation of vapors or atomized fluids, the insufflation of powders, into the nose, fauces, larynx, etc., and the use of a medicated nasal douche, are methods whereby this channel is utilized.

The Veins and Arteries. (Transfusion). —Are only used as a route of medication in emergencies, where the other channels are not available, and where immediate action is necessary to the preservation of life, the operation being a highly dangerous one. The danger of the operation lies in the liability of introduction of air to the circulation, an occurrence which causes instant death in the human subject.

Hypodermic Method.—The effective introduction of remedial agents into the system by subcutaneous injection is now justly regarded as one of the most active and reliable of therauptic resources. It may be used in two essentially different ways.

1. The remedy is thrown into the subcutaneous cellular tissue by means of a sharp pointed hollow needle attached to a carefully graduated glass syringe, the little prick must be made as rapidly as possible, either by direct puncture or in a more valvular direction, through a pinched up fold of skin, and care must of course be taken to avoid the neighborhood of all important structures.

2. This method consists in plumping the point of the needle into the muscles, and forcing the fluid freely among the fibers, and in the immediate neighborhood of painful nerves. This is a method to be strictly avoided by the nurse.

Where Injections should be Given.—The most suitable localities for the injection are the external

aspect of the arms and thighs, the abdomen, the back, and the calves of the legs. On the external aspect of the thighs, just in front of the great trochanter, there is an area of some two inches square, over which the insertion of a fine hypodermic needle is not felt, so

barren is the skin in that region of sensitive nerve filaments.

After nearly filling the syringe wilh the solution to be used, the needle should be screwed on tightly, and

with the instrument held in a vertical position point uppermost, the excess of solution over the amount required should be ejected, thus expelling air-bubble and filling the needle itself. The needle should then be quickly inserted until its point has passed beneath the skin, when the piston may be pressed down slowly, delivering the solution gradually so as to avoid rupturing the tissue. If the solutions are freshly prepared with clean water, the needle kept clean and sharp, and the injection be made *beneath* the skin *not into it*, there will no risk of producing abscesses with the agents ordinarily employed.

The Skin is an active absorbent of crystaloidal substances when its epidermis or cuticle is removed. By this route there are four methods of introducing medicaments into the circulation, viz.—the enepedermic, epidermic and endemic methods, and inoculation,

Enepedermic method consists in placing the medicine in simple contact with the epedermis, no friction being used to hasten its penetration. Solutions of the alkaloids in chloroform and oleic acid pass by osmosis in this manner with comparative ease, but aqueous solutions act very slowly, and alcoholic ones with great difficulty, if at all.

The Epidermic Method consists in the use of friction to promote the passage of the medicament between the cells of the epedermis. Mercurial ointment, cod-liver oil, and other fats, oleates, etc., are used in this way for their local and systemic effects.

The Endermic Method obviates the difficulty of absorption through the cuticle by removing the latter through the agency of a blister, and then powdering the medicament over the surface of the denuded derma,

Inoculation is the introduction of medicinal agents through the scraped or punctured skin by an operation similar to that employed for vaccination,

Overdoses.—If medicine appears to the nurse to be producing any **marked symptoms** in a patient such as vomiting, diarrhœa, pain in the stomach, headache, drowsiness, convulsive movements of the muscles, running at the eyes, nose or mouth, or if the nurse discover that by some mischance a patient has had an overdose, or that any mistake has occurred, he should at once inform the medical attendant, as prompt use of remedies gives the only hope of saving in cases of poisoning.

Powders.—Powders are conveniently given either mixed with a little water or milk, or made into a paste with jam, honey, or treacle.

Prescribing.—A nurse should never administer any medicine on his own responsibility, except in the case of an emergency. You may not do much or any harm by merely giving a simple purgative, but why assume a responsibility that is clearly anothers duty.

Hours.—Medicine should be given at regular hours and careful attention should be paid to the directions as to the time when they are ordered to be given—as for instance before or after meals.

Quantity.—The exact quantity ordered should be measured from a regular glass, as even a slight error may cause serious illness if often repeated.

Medicine Glasses.—The glass from which medicine has been given to one patient, should always be cleaned before being used for another. It is a good plan to keep a separate measure for oily or strong-smelling medicine, such as castor oil, cod-liver oil,

valerian or assafœatida, since it is not easy to get rid of the smell at a moments notice.

Labels.—Never give any part of a mixture without looking at the label, and it will do no harm to ac. quire the habit of giving all mixtures a slight shake before using them, and when pouring them out, to keep the labeled side of the bottle up, which will prevent the directions from being blotted with drops of the mixture.

Uncorked Bottles.—Never allow a bottle to stand uncorked; volatile mixtures will quickly lose their strength, and others by evaporation of the water in them will actually in a given quantity become stronger. Some should not be exposed to the light, for example chloroform, solution of nitrate of silver, etc.

Doses.

The dose of a medicine is evidently not a fixed quantity, but varies within certain limits, being influenced by the amount of effect desired to be produced, the age, sex, temperament, habit, climate, the condition of the stomach and idiosyncrasies of the patient.

Age.—For an adult, suppose the dose to be one, or 1 drachm, under 1 year will require only 1-12, or 5 grains. Under 2 years will require only 1/8 or 7½ grains. Under 3 years will require only 1/6, or 10 grains. Under 4 years will require only ¼, or 15 grains. Under 7 years will require only ⅓, or 1 scruple. Under 14 years will require only ½, or ½ drachm. Under 20 years will require only ⅔, or 2 scruples. Above 21 years, the full dose, 1 drachm. Above 65, the inverse gradation of above. Opiates effect child-

ren more powerfully than adults, but children bear larges doses of calomel than adults.

Sex.—Women require smaller doses than men; they are more rapidly affected by purgatives than men.

Temperament.—Stimulants and purgatives more readily effect the sanguine than the phlegmatic, and consequently the former require smaller doses.

Habits.—The knowledge of habits is essential; for persons in the habitual use of stimulants and narcotics require larger doses to affect them when laboring under disease, while those who have habituated themselves to saline purgatives, are more easily affected by these remedies. Persons, however, who have habituated themselves to the use of opium, do not require larger doses than usual of other narcotics.

Climate.—Narcotics act more powerfully in hot than in cold climates, hence smaller doses are required in the former; but the reverse is the case with regard to calomel.

Condition of the Stomach and Idiosyncrasy.—The least active remedies operate very violently on some individuals owing to peculiarity of stomach, or rather disposition of body, unconnected with temperament. This state can be discovered only by accident, or time, but when it is known, it should always be attended too.

Posological Table.

Name	Common Name	Metric System	Apothecary Weight	Physiological Action
ACIDUM ACETICUM	Acetic acid			A mild caustic, destroys corns and warts.
Acidum Aceticum Dilutum		4.0—8.0	ʒ 1—2	
ACIDUM BORICUM	Boric acid or Boracic acid			Mild stimulant, germicide. In chronic cystitis and septic diseases.
Acidi Borici		0.50—1.00	gr 8—16	
ACIDUM CARBOLICUM	Carbolic acid	0.06—0.18	gr 1—3	Local anæsthetic and caustic, when used in concentrated solution. Large doses internally, paralytic to the respiratory centres and heart.
Unguentum Acidi Carbolici	10%	External use		
ACIDUM CITRICUM	Citric acid			Refrigerant and antiseptic.
Acidi Citrici		0.30—2	gr 5—3½	
Syrupus Acidi citrici		4.0—15.0	ʒi—4	
ACIDUM GALLICUM	Gallic acid			Astringent, but less so than tannic acid.
Acidi Gallici		0.30—1.30	gr 5—20	
ACIDUM HYDROBROMICUM DILUTUM	Diluted Hydrobromicum acid 10%			
Acidi Hydrobromici diluti		2.0—4.0	m 30—ʒi	Chiefly used as a hypnotic, and added to quinine mixtures to prevent cinchonism.
ACIDUM HYDROCHLORICUM	31.9% Muriatic acid			Alterative, Eschaortic.

Name	Common Name	Metric System	Apothecary Weight	Physiological Action
Acidi Hydrochlorici Diluti		0.50—1.00	m 8—15	
ACIDUM HYDROCYANICUM DILUTUM	2% Prussic acid			Hydrocyanic acid is one of the most rapid and deadly poisons known, paralyzing respiratory centres and heart, diluted it is sedative, anodyne and anti-spasmodic.
Acidi Hydrocyanici Diluti		0.06—0.18	m 1—3	
Potassii Cyanidum		0.004—0.015	gr 1-16—⅛	
ACIDUM LACTICUM	sp. gr. 1 212			In dyspepsia, especially combined with pepsin.
Acidi Lactici	Lactic acid	1.0—4.0	m 15—31	
ACIDUM NITRICUM of the sp. gr 1.420 69.4 %		Nitric acid		Chiefly used in preparations.
Acidum Nitricum Dilutum		1.0—3.0	m 15—45	Tonic.
ACIDUM NITROHYDROCHLORICUM	Nitro-Hydrochloric acid, (Nitric acid and hydrochloric acid mixed, 4 to 15)	0.60—2.0	m 10—ʒ ½	Stomachic tonic, and to increase secretion of the liver and intestines.
ACIDUM SALICYLICUM	Salicylic acid			Antiseptic, germicide, Antifermentative and antipyretic.
Acidi Salicylici		0.50—04.0	gr 8—ʒ 1	
Lithii Salicylas		0.06—0.50	gr 1—8	
Sodii Salicylas		0,30—2.0	gr 5—ʒ ½	
ACIDUM SULPHURICUM	Sulphuric acid, oil of vitriol			In local pains in the form of ointment made of lard ʒi sulphuric acid ʒi.

Acidum Sulphuricum Dilutum		0.40—1.50	m 5—20	Tonic, astringent.
Acidum Sulphuricum Aromaticum		0.30—0.60	m 5—10	An agreeable form for administration.
ACIDUM SULPHUROSUM	sp. gr 1.022 sulphurous acid			Germicide, Antifermentative.
Acidi Sulphurosi		0.60—8.0	m 10—ʒii	
Magnesii Sulphis	Epsom salts	1.0—4.0	gr 15—ʒ i	Purgative.
Sodii Bisulphis		0.50—2.0	gr 8—ʒ ½	
Sodii Hyposulphis		0.30—1.30	gr 5—20	
Sodii Sulphis	Glauber's salts	1.0—4.0	gr 15—ʒi	Purgative.
Potassii Sulphis		0.12—0.60	gr 2—10	
ACIDUM TANNICUM	Tannic acid			Astringent.
Acidi Tannici		0.06—1.30	gr 1—20	
ACIDUM TARTARICUM	Tartaric acid	0.65—1.30	gr 10—20	
ACONITUM	Aconite			Depressant to sensory nerves and heart, produces heat, tingling and numbness applied locally.
Abstractum Aconiti		0.01—0.12	gr 1-6—2	
Extractum Aconiti		0.01—0.045	gr 1-6—¾	
Ex. Aconiti Fl.		0.03—0.12	m ½—2	
Tinctura Aconiti		0.06—0.24	m 1—4	
ÆTHER	Ether, Sulphuric ether			Anæsthetic, narcotic, diffusible stimulant, refrigerant by evaporation.
Ætheris				
Æther Fortior	sp. gr. 725 stronger ether	0.25—3.50	m 5—ʒi	
Spiritus Ætheris		3.50—14.0	ʒ i—4	

Name	Common Name	Metric System	Apothecary Weight	Physiological Action.
Spiritus Ætheris Co.		1.70—7.0	ʒ ½—2	
Spt. Ætheris Nitrosi	sweet spirit of nitre	1.70—14.0	ʒ ½—4	
Æther Aceticus	Acetic ether	1.70—3.50	ʒ ½—1	
ALCOHOL	Rectified spirits of wine 94 %			*Locally* applied it is astringent, when its *vapor* is inhaled it causes anæsthesis, taken *internally in small doses* it increases appetite and digestion, temporarily increases the force and frequency of the cardiac systole; *large doses* disorder digestion and cause the well-known alcoholic intoxication. As a *cardiac stimulant* alcohol is used in *syncope* from exhaustion, loss of blood, surgical shock, and where *cardiac failure* is threatened, as in Typhoid fever.
Alcohol Dilutum	Equal parts alcohol and water sp. gr. 0.928			
Spiritus Frumenti	Whiskey 40%—50%			
Spiritus Vini Gallici	Brandy 39%—47%			
Spiritus Odoratus	Cologne Water			
Vinum Album	White wine 10%—12%			
Vinum Album Fortius	20%—25%			
Vinum Aromaticum		15.0—30.0	ʒ½—1	
Vinum Rubrum	Red wine 10%—12%			
ALOE	Aloes			Stimulating cathartic, acting chiefly on large intestines: emmenagogue, anthelmintic.
Aloe Purificata		0.03—0.60	gr½—10	
Ex. Aloes Aquosum		0.03—0.36	gr ½—6	
Tinct Aloes		0.50—13.50	m 8—34	
Tinct Aloes et Myrrhæ		2.0—7.50	ʒ ½—2	

Vinum Aloes		4.0—30.0	ʒ 1—ʒ 1	
AMMONIACUM	Ammoniac			Stimulant, expectorant; in large doses cathartic.
Ammoniaci		0.50—4.0	gr 8—ʒ i	
Mistura Ammoniaci		15.0—30.0	℥ ½—ʒ i	
AMMONIA	A gas			Is a rapid and powerful *cardiac stimulant* but its effects are of brief duration.
Aqua Ammoniæ	10% of gas	0.60—1.20	m 10—20	
Aqua Amm. Fortior	28% of gas	0.20—0.40	m 3—6	A powerful corrosive poison.
Spiritus Ammoniæ		0.60—4.0	m 10—ʒ i	
Spt. Ammoniæ Arom.		2.0—8.0	ʒ ½—2	
Liq. Ammonii Acetatis		15.0—45.0	℥ ½—1½	
Ammonii Benzoas		0.60—1.20	gr 10—20	
Ammonii Bromidum		0.50—2.0	gr 7—30	
Ammonii Carbonas		0.13—0.65	gr 2—10	
Ammonii Chloridum		0.06—2.0	gr 1—3½	
Ammonii Iodidum		0.12—0.65	gr 1—10	
Ammonii Phosphas		0.65—1.30	gr 10—20	
Ammonii Valerianas		0.12—0.50	gr 2—8	
AMYGDALA AMARA	Bitter almond			Sedative.
Aqua Amygdalæ Amaræ		15.0	℥ ½	
Oleum Amygdalæ Amaræ		0.01—0.03	m 1-5—½	
AMYGDALA DULCIS	Sweet almond			Demulcent.
Syrupus Amygdalæ		5.0—40.0	ʒ i—℥ i	
Ol. Amygdalæ Expressum		3.50—14.0	ʒ i—℥ ss	
AMYL NITRIS	The nitrate of amyl			Cardiac stimulant. depressant on spinal centres.

Name	Common Name	Metric System	Apothecary Weight	Physiological Action,
Amyl Nitris		0.05—15.0	dr 1—5 m 1—3	Inhalation. Internal
ANISUM	Anise			Carminative.
Anisi		0.65—1.30	gr 10—20	
Aqua Anisi				
Oleum Anisi		0.05—0.25	m 1—5	
Spiritus Anisi		4.0—8.0	z1—2	
ANTIMONIUM	Antimony			When applied *locally* to the skin the salts of antimony produce an eruption of papules, which become pustulis, somewhat resembling the eruption of small pox. *Internally in small doses*, they are diaphoretic. In somewhat larger doses, they cause nausea, depressed circulation, weakness and inceeased'mucous secretions. In *large doses* they are emetic.
Antimonii et Potassii Tartras	Tartar emetic	0.002—0.06	gr 1-32—1	
Antimonii Sulphnratum		0.06—1.25	gr 1—20	
Pulvis Antimonalis	James Powder	0.20—0.52	gr 3—8	
Vinum Antimonii		0.60—3.75	m 10— ʒ i	
ARNICOÆ RADIX	Arnica root			Narcotic, stimulant, diuretic, emmenagogue. Tincture used as an embrocation in sprains and bruises.
Arnicæ radicis		0.60—2.0	gr 10—ʒ ½	
Ex. Arnicæ Rad		0.30—0.60	gr 5—10	
Ex. Arnicæ Rad Fl.		0.60—2.0	m 10—ʒ ½	
Tinct Arnicæ Rad		7.50—18.0	z 2—5	
ARSENIUM	Metal arsenlum			Not used.

Acidum Arseniosum	Arsenic	0.002—0.006	gr 1-30-1-10	Externally powerful caustic, used in cancer etc.
Arsenii Iodidum		0.003—0.006	gr 1-30-1-10	
Liq. Acide Arseniosi		0.30—0.60	m 5—10	
Liq. Arsenii et Hydrargyri Iodidi	Donovan's Solution	0.05—0.60	m 1—10	A very powerful alterative.
Sodii Arsenias		0-003—0.20	gr 1-20—⅛	
Liq. sodii Arsenites	Pearson's solution	0.20—0.60	m 3—10	
Liq. Potassii Arsenites	Fowler's solution	0.20—0.60	m 3—10	Much used as alterative.
ASAFŒTIDA	Asafetida			
Asafœtidæ		0.30—1.0	gr 5—15	
Mistura Asafœtidæ	Milk of A.	15.0—30.0	℥ ½—1	
Tinctura Asafœtidæ		2.0—4.0	ʒ ½—1	
AURUM	Gold			
Auri et Sodii Chloridum		0.005	gr 1-12	Antiscrofulitic, Antisyphilitic.
BELLADONNÆ FOLIA	Belladonna leaves			Powerful narcotic, with diaphoretic and diuretic properties.
Tinctura Belladonnæ		0.30—2.0	m 5—30	
Ex. Belladonnæ Alcoholicum		0.008—0.03	gr. ⅛—½	
BELLADONNÆ RADIX	Belladonna Root			
Abstractnm Belladonnæ		0.03—0.06	gr ½—1	
Ex. Belladonnæ Fl.		0.06—0.12	m 1—2	
Atropina	Alkaloid prepared from Belladonna			Action like Belladonna. To dilate pupil of eye. To inflamation.

Name	Common Name	Metric System	Apothecary Weight	Physiological Action
Atropinæ Sulphas		0.0003—0.0012	gr 1-200—1-50	
BISMUTHUM	Bismuth			Used internally as *sedative* and *astringent* to check nausea and vomiting in *gastric irritation*. In acute and chronic diarrhœas they are very valuable and *externally* as mild astringents and antiseptics.
Bismuthi Citras (sol)		0.06—0.20	gr 1—3	
Bismuthi Subcarbonas		0.60—4.0	gr 10—ʒi	
Bismuthi Subnitras		0.60—4.0	gr 10—ʒi	
BROMUM	Bromine			Externally is caustic. Internally is an alterative, sedative.
Ammonii Bromidum		0.30—2.0	gr 5—30	
Calcii Bromidum		1.0—2.0	gr 15—30	
Lithii Bromidum		0.65—1.30	gr 10—20	
Potassii Bromidum, Sodii Bromidum		0.30—4.0	gr 5—ʒi	
Zinci Bromidum		0.12—0.40	gr 2—6	
CAFFEINA	Caffeine			A feeble alkaloid from coffee and tea.
Caffeinæ citras		0.03—0.30	gr ½—5	
CALCIUM	Calcium			
Calcii Bromidum		1.0—2.0	gr 15—30	
Calcii Chloridum		0.60—1.30	gr 10—20	
Calcii Phosphas Præcipitus		0.60—2.0	gr 10—30	
Calcii Hypophosphis		0.20—0.30	gr 3—5	

Liq. Calcis		8.0—60.0	ʒii—℥ii	
CAMPHORA	Camphor	0.33—0.65	gr 5—10	Narcotic, diaphoretic, sedative, externally anodyne.
Camphora Monobromata		0.33	gr 5	
Aqua Camphoræ		15.0—30.0	℥ ½—1	
Spiritus Camphoræ		0.30—3.75	m 5—ʒ i	
CANNABIS INDICA	Indian Hemp			Powerful narcotic, less certain but less troublesome than opium.
Ex. Cannibus Indicæ		0.016—0.06	gr ¼—1	
Ex. Cannabis Ind. Fl.		0.03—0.06	m ½—1	
Tinct. Cannabis Indicæ		1.90	ʒ ½	
CANTHARIS	Spanish fly			A powerful irritant, with tendency to urinal and genital organs.
Tinctura Cantharidis		0.06—0.30	m 1—5	
CAPSICUM	Cayenne Pepper			Stimulant, rubefacient.
Tinct. Capsici		1.90—3.75	ʒ ½—1	
CARUM	Caraway			Aromatic, carminative, stimulant. Prevents griping of medicines.
Oleum Cari		0.06—0.60	m 1—10	
CAROPHYLLUS	Cloves			Stimulant, aromatic; a condiment.
Oleum Caryophylli		0.12—0.36	m ii—6	
CATECHU	Catechu			Astringent tonic.
Tinct Catechu Co.		1.90—11.25	ʒ ½—3	
CETRARIA	Iceland Moss			Tonic demulcent, nutrient.
Decoctum Cetrariæ		15.0—60.0	℥ ½—2	

Name	Common Name	Metric System	Apothecary Weight	Physiological Action,
CHIMAPHILA	Wintergreen			Diuretic, tonic, astringent.
Ex. Chimaphilæ Fl.		3.75	ʒ i	
CHLORAL	Hydrate of Chloral			A powerful and useful hypnotic.
Chloralis		0.30—4.0	gr 5—ʒ 1	
CROTON-CHLORAL	Croton-chloral			
Croton-Chloralis		0.12—0.40	gr 2—6	
CHLORINIUM	Chlorine			Disenfectant and antiseptic, locally applied an irritant.
Aqua Chlori		4.0—16.0	ʒ i—℥ ½	
Liq. Sodæ Chloratæ	Labariaque's sol.	2.0—4.0	ʒ ½—1	
CIMICIFUGA	Black Snakeroot			Sedative, diuretic and diaphoretic.
Ex. Cimicifuga Fl.		2.0—4.0	ʒ ½—1	
Tinct. Cimicifuga		2.0—8.0	ʒ ½—2	
CINCHONA	Cinchona			Tonic, antiperiodic, febrifuge, antipyretic, is an antiseptic. The principal use of cinchona is in the malarial diseases, over which its influence is that of a speeific.
Cinchonia, Cinchoniæ Sulphas		0.06—2.0	gr 1—ʒ ½	
Quinina				
Quininæ Hydrobromas, Quininæ Hydrochloris, Quininæ Sulphas		0.06—2.60	gr 1—40	

Quininæ Bisulphis		0.06—2.0	gr 1—ʒ ½	
Quininæ Valerianas		0.06—0.12	gr 1—2	
Infusum Cinchonæ		30.0—60.0	℥ 1—2	
CINCHONA FLAVA	Yellow Cinchona			
Ex. Cinchonæ	Calisaya Bark	0.12—1.0	gr 2—15	
Ex. Cinchonæ Fl.		4.0	ʒ i	
Tinct. Cinchonæ		2.0—8.0	ʒ ½—2	
CINCHONA RUBRA	Red Bark			
Cinchonidniæ Sulphas		0.06—2.60	gr 1—40	
Tinct. Cinchonæ Compos	Auxanis Tincture	4.0—16.0	ʒ 1—4	
COLCHICI RADIX	Colchicum Root			Narcotic, diuretic, cathartic.
Ex. Colchici Radicis		0.03—0.13	gr ½—2	
Ex. Colchici Radicis Fl.		0.10—0.25	m ii—4	
Vinum Colchici Radicis		0.30—1.0	m 5—15	
COLCHICI SEMEN	Colchicum seed			
Ex. Colchici Semenis Fl.		0.13—0.30	m 2—6	
Tinctura Colchici		2.0—4.0	ʒ ½—1	
Vinum Colchici Semenis		2.0—4.0	ʒ ½—1	

Name	Common Name	Metric System	Apothecary Weight.	Physiological Action.
COLCYNTHIS	Bitter Cucumber			Cathartic of rapid action.
Ex. Colcynthidis		0.20—0.30	gr 3—5	
Ex. Colcynthidis Comp.		0.06—1.30	gr 1—20	
CONIUM	Spotted Hemlock			A spinal depressant; poisonous.
Abstractum Conii		0.06—0.13	gr 1—2	
Tinct. Conii		1.90	ʒ ½	
COPAIBA	Balsam of Copaiba			Stimulant, diuretic, laxative; act on the urethra.
Oleum Copaibæ		0.60—0.90	m 10—15	
Massa Copaibæ		0.30—2.50	gr 5—40	
CREASOTUM	Creasote	0.06—0.18	m 1—3	Antiseptic, astringent, absorbent of gases. Inhaled in Ozæna (ʒi to 2). Fetid expectoration.
Aqua Creasoti		3.75—15.	ʒ i—℥ ½	
CUBEBA	Cubeb			Cathartic, diuretic, stimulant. Its stimulating action more particularly felt on the mucous membrane of bladder and urethra.
Cubeba, powdered		1.90—11.65	ʒ ½—3	
Ex. Cubebæ Fl		0.60—2.50	m 10—40	
Oleum Cubebæ		0.90—1.90	m xv—ʒ ½	
Oleoresina Cubebæ		0.60—0.90	m 10—15	
Tinctura Cubebæ		7.50—22.50	ʒ 2—6	
Trochisci Cubebæ		1= gr ½ of oleoresinæ		
DIGITALIS	Foxglove			Cardiac tonic, diuretic, sedative, slowing and rendering more forcible the heart beats.
Digitalis, powdered		0.06	gr 1	
Abstractum Digitalis		0.03—0.06	gr ½—1	

Extractum Digitalis		0.016	gr ¼	
Ex. Digitalis Fl.		0.06—0.12	m 1—2	
Tinctura Digitalis	7 m=gr i	0.60—1.25	m x—20	
Infusum Digitalis	66 m=gr i	3.75—15.	ʒ i—℥ ½	
DULCAMARA	Bittersweet			Diuretic, sudorific, narcotic, alterative.
Ex. Dulcamaræ Fl.		1.90—3.75	ʒ ½—1	
ELATERINUM	Elaterin	0.003—0.004	gr 1-20—1-16	Powerful hydragogue cathartic, used to draw off dropsical fluids and withdraw fluid from the blood.
Trituratis Elaterini		0.03—0.04	gr ½—⅝	
ERGOTA	Ergot			A stimulant of the vaso-motor nerve centers. Dry gangrene, etc., result from too long and free use.
Ergota, powdered		1.90—7.50	ʒ ½—2	
Ex. Ergotæ		0.33—1.90	gr 5—ʒ ½	
Ex. Ergotæ Fl.		1.90—15	ʒ ½—℥ ½	
Vinum Ergotæ		7.50—60.	ʒ 2—℥ 2	
Ergotin Bonjeaus		0.33—0.65	gr 5—10	
ERYTHROXYLON	Coca			Nerve stimulant, similar but more powerful than tea or coffee.
Ex. Erythroxyli Fl.		1.25—3.75	m 20—ʒ i	
Cocaine Hydrochlorate	Alkaloid	0.016—0.06	gr ¼—1	The hydrochlorate of cocaine has attained celebrity as a local anæsthetic.
FERRUM	Iron			Tonic, increasing red globules of the blood.
Ferri Arsenias	Arsenate of Iron		gr ⅛—1-10	In chronic skin diseases.

Name	Common Name	Metric System	Apothecary Weight	Physiological Action
Ferri Chloridum	Ferric Chloride	0.06—0.13	gr 1—2	
Ferri Citras	Ferric Citrate	0.12—0.60	gr 2—10	A pleasant chalybeate.
Ferri Hypophosphis	Hypophosphite of iron	0.30—0.60	gr 5—10	
Ferri Iodidum	Iodide of Iron	0.06—0.50	gr 1—8	Tonic, emmenagogue.
Ferri Lactas	Ferrous Lactate	0.12—0.60	gr 2—10	
Ferri Phosphas	Ferric Phosphate	0.12—0.30	gr 2—5	In amenorrhœa and dyspepsia.
Ferri Sulphas	Copperas	0.03—0.12	gr ½—2	An astringent chalybeate, and emetic.
Ferri Valenanas	Ferric Valenanate	0.06—0.20	gr 1—3	
GAULTHERIA	Wintergreen			Astringent and tonic, used to flavor mixtures.
Oleum Gaultheriæ		0.30—1.25	m 5—20	
Spiritus Gaultheriæ		0.60—1.25	m 10—20	
GELSEMIUM	Yellow Jasmine			A spinal depressant.
Ex. Gelsemii Fl.		0.12—0.18	m 2—3	
Tinctura Gelsemii		0.65—1.25	m 10—20	
GENTIANA	Gentian			Bitter tonic, nonastringent.
Extractum Gentianæ		0.13—0.65	gr 2—10	
Ex. Gentianæ Fl.		0.60—1.90	m 10—ʒ ½	
Tinct. Gentianæ Compos		3.75—7.50	ʒ i—2	

HÆMATOXYLON	Logwood			
Extractum Hæmatoxylon		0.65—1.95	gr 10—ʒ ½	Astringent, used in diarrhœa and mucous discharges, imparts a pink color to fæces.
HEDEOMA				
Oleum Hedeomæ	American Pennyroyal	0.12—0.60	m 2—10	Aromatic, stimulant. In flatulent colic, sick stomach.
HYDRARGYRUM	Mercury			Antisyphilitic, purgative, antiseptic, *minute doses* of mercurials not too frequently repeated, increase the number of red corpuscles in the blood. *In small and repeated doses* they stimulate the secretions of the skin, liver, kidneys, salivary glands, and pancreas and promote absorption; *moderate doses* are cathartic, *large doses* continued salivation occurs.
Hydrargyrum Cum Creta	(Hydg. 38 %) Gray Powder	0.30—1.50	gr 5—25	
Massa Hydrargyri	(⅓ Mercury) Blue Mass	0.06—0.65	gr 1—10	
Hyd. Chloridum Mite	Calomel	0.03—1.0	gr ½—15	
Hyd. Iodidum Veride	Green Iodide	0.012—0.06	gr 1-5—1	
Hyd. Chloridum Corrosium	Corrosive Sublimate	0.002—0.006	gr 1-30—1-10	
Hyd. Iodidum Rubrum	Red Iodide	0.002—0.006	gr 1-30—1-10	
Hyd. Cyanidum		0.003—0.008	gr 1-20—⅛	
HYOSCYAMUS	Henbane			Sedative; similar to Belladonna, but more hypnotic.
Abstractum Hyoscyami		0.13—0.18	gr 2—3	
Ex. Hyoscyami Fl.		0.30—0.60	m 5—10	
Tinct. Hyoscyami		1.90—7.50	ʒ ½—2	
Hyoscyaminæ Sulphas		0.001	gr 1-60	

	Common Name	Metric System	Apothecary Weight	Physiological Action
IODUM	Iodine			Alterative, antisyphilitic, antiscrofulitic, sialagogue.
Potassii Iodidum		0.13—0.65	gr 2—10	
Sodii Iodidum		0.33—1.30	gr 5—20	
Zinci Iodidum		0.03—0.13	gr ½—2	
Liq. Iodi Compos	Lugol's solution	0.30—0.90	m 5—15	
Tinct. Iodi		0.18—0.60	m 3—10	
IPECACUANHA	Ipecac			Diaphoretic, expectorant, emetic, in small doses stimulant to stomach.
Ex. Ipecacuanhæ Fl.		0.015—1.90	gr ¼—ʒ ½	
Pulvis Ipecacuanhæ et Opii	Dover's powders	0.33—1.0	gr 5—15	
Tinct. Ipecacuanhæ et Opii		0.30—0.90	m 5—15	
Syrupus Ipecacuanhæ		0.60—15.0	m 10—℥ ½	
IRIS	Blue Flag			Cathartic, emetic, diuretic.
Extractum Iridis		0.12—0.25	gr 2—4	
Ex. Iridis Fl.		0.60—1.30	m 10—20	
JALAPA	Jalap			An active cathartic.
Jalapa, powdered		1. —1.95	gr 15—ʒ ½	
Abstractum Jalapæ		0.65—1.	gr 10—15	
Resina Jalapæ		0.13—0.33	gr 2—5	
Pulvis Jalapæ Compositus		1.95—3.90	ʒ ½—1	
KINO	Kino			Powerful astringent.

Kino, powdered		0.65—1.95	gr 10—ʒ ½	
Tinctura Kino		3.75—7.50	ʒ 1—2	
KRAMERIA	Rhatany			Astringent, tonic.
Krameria powdered		1.30—1.95	gr 20—ʒ i	
Extractum Krameriæ		0.65—1.30	gr 10—20	
Ex. Krameriæ Fl.		0.60—3.75	m 10—ʒ i	
Syrupus Krameriæ		3.75—11.25	ʒ i—3	
Tinctura Krameriæ		3.75—15.	ʒ 1—℥ ss	
LITHUM	Lithum			Antacid, acts strongly as a diuretic.
Lithii Benzoas		0.65—1.95	gr 10—ʒ ½	
Lithii Carbonas		0.33—1.	gr 5—15	
Lithii Citras		0.65—1.95	gr 10—ʒ ½	
Lithii Salicylas		1.30—2.60	gr 20—40	
LOBELIA	Indian Tobacco			Antispasmodic, diaphoretic, emetic, expectorant, used in bronchial spasm and asthma.
Ex. Lobeliæ Fl.		0.06—0.30	m 1—5	
Acetum Lobeliæ		2. —7.50	ʒ ½—2	
Tinctura Lobeliæ		1. —3.75	m 15—ʒ i	
MAGNESIUM	Magnesium			Antilithic, cathartic, diuretic.
Magnesii Carbonas		1.95—15.	ʒ ½—℥ ½	
Magnesii Sulphas	Epsom salt	15. —30.	℥ ½—1	
MYRRHA	Myrrh			Stimulant, tonic, with tendency to lungs and uterus.
Myrrha, powdered		0.65—1.95	gr 10—ʒ ½	
Tinctura Myrrhæ		0.90—1.90	m 15—ʒ ½	

Name	Common Name	Metric System	Apothecary Weight	Physiological Action,
NUX VOMICA	Nux Vomica			*Small doses.* Tonic, stimulate respiration, secretion, appetite and digestion. *Full dose*, pupils dilated, limbs jerk, respiration spasmodic, lower jaw stiff, face wearing an unmeaning smile, *Toxic doses*, spasms, death, from tetanic fixation of the muscles of respiration.
Abstractum Nucis Vomicæ		0.06—0.12	gr 1—2	
Extractum Nucis Vomicæ		0.03—0.12	gr ½—2	
Ex. Nucis Vomicæ Fl.		0.18—0.30	m 3—5	
Tinctura Nucis Vomicæ		0.90—1.50	m 15—25	
Strychnina A. Strychninæ Sulphas	An alkaloid of Nux Vomica	0.001—0.003	gr 1-60—1-20	Exalt all the functions of the spinal cord—reflex, motor, vasa-motor, and sensory—the latter being least affected.
OLEUM MORRHUÆ	Cod Liver Oil	15. —	℥ ½—	In impaired nutrition.
OLEUM OLIVÆ	Sweet Oil or Olive Oil	30. —60.	℥ i—2	Emollient.
OLEUM RICINI	Castor Oil	15. —	℥ ½—	Laxative.
OLEUM SANTALI	Oil of Sandalwood or Oil of Santal	1.25—1.90	m 20—ʒ ½	
OLEUM SESAMI	Benne oil or oil of Sesamum			
OLEUM SUCCINI	Oil of Amber	0.30—0.90	m 4—15	
OLEUM THEOBROMÆ	Cocas Butter			Used in Ointments.

OLEUM TIGLII	Croton Oil	0.03—0.12	m ½—2	External irritant; drastic purge.
OPIUM	Opium			Analgesic, hypnotic, diaphoretic, antispasmodic, narcotic, also a cardiac and respiratory depressant, after brief stimulation thereof. *Contra-indications* for the use of opium are—alcoholism, disease of the respiratory organs advanced disease of the kidneys, and some forms of cerebral congestion and cardiac disease.
Opii pulvis	powdered opium	0.03—0.13	gr ½—2	
Opium Denarcotizum		0.03—0.13	gr ½—2	
Extractum Opii	About twice the strength of Opium	0.03—0.06	gr ½—1	
Tinct. Opii	Opium 1 part in 10 Laudanum	0.30—1.25	m 5—25	
Tinct. Opii Deodorata	Opium 1 part in 10. McMunn's Elixir	0.30—1.25	m 5—25	
Tinct. Opii Camphorata	Opium nearly gr 2 in ℥ i Paregoric	3.90—7.80	℥ i—2	
Acetum Opii	Opium 1 part in 10 Black Drop	0.30—0.65	m 5—10	
Vinum Opii	Opium 1 part in 10. Sydenham's mixture	0.22—0.90	m 4—16	
ALKALOIDS OF OPIUM				
MORPHINA	Morphine			

Name	Common Name	Metric System	Apothecary Weight.	Physiological Action.
Morphinæ Sulphas Morphinæ Hydrochloras Morphinæ Acetas	gr ¼ about equals Opium gr i	0.008—0.03	gr ⅛—½	
Liq. Morphinæ Sulph.	gr 1 in ℥i U.S. solution	3.90—7.80	ʒ i—2	
Pulvis Morphinæ Compos	gr x=morp.sulph. gr 1-6 Tully's powder	0.32—1.00	gr 5—15	
Codeina		0.015—0.12	gr ¼—2	
PILOCARPUS	Jaborandi			Powerful diaphoretic and sialogogue.
Ex. Pilocarpi Fl.		0.90—1.90	m 15—ʒ ½	
Pilocarpunæ Hydrochloras		0.008—0.02	gr ⅛—⅓	
POTASSIUM	Caustic Potash Potassium			
Liq. Potassæ 5½ %		0.30—1.25	m 5—20	
Pottassæ Sulphurata		0 13—0.65	gr 2—10	Local irritant, antacid, sedative.
Potassii Carbonas		0.65—1.95	gr 10—ʒ ½	Antacid in dyspepsia, diuretic and antilithic.
Potassii Bicarbonas		1.30—3.90	gr 20—ʒ i	Similar to carb. but milder taste.
Potassii Chloras		0.65—1.30	gr 10—20	Stimulant to mucous membrane.
Potassii et Sodii Tairras	Rochelle salts	3.90—31.0	ʒ i—℥ i	Mild cooling purgative.

PRUNUS VIRGINIANA	Wild Cherry			Tonic, sedative.
Ex. Pruni Virginianæ Fl.		1.90—3.90	ʒ ½—1	
Inf. Pruni Virginianæ		60.0	℥ 2	
Syr. Pruni Virginianæ		15.0	℥ ½	
RHEUM	Rhubarb			Purgative, astringent, stomachic.
Rheum, powdered		0.33—1.95	gr 5—ʒ ½	
Ex. Rhei		0.33—0.65	gr 5—10	
Ex. Rhei Fl.		0.30—1.90	m 5—ʒ ½	
Tinct. Rhei		3.75—7.50	ʒ i—2	
Vinum Rhei		3.75—15.0	ʒ i—℥ ½	
RUBUS	Blackberry			Root tonic and astringent, a domestic remedy, in bowel affections.
Ex. Rubi Fl.		1.90—3.75	ʒ ½—1	
Syr. Rubi		3.75—15.0	ʒ i—℥ ½	
SABINA	Savine			Irritant, Emmenagogue, escharotic.
Ex. Sabinæ Fl.		0.18—0.50	m 3—8	
Oleum Sabinæ		0.12—0.30	m 2—5	
SARSAPARILLA	Sarsaparilla			Alterative, demulcent, diuretic, tonic.
Ex. Sarsaparillæ Fl.		1.90—3.75	ʒ ½—1	
Syr. Sarsaparillæ Co.		15.0	℥ ½ or more	
SCOPARIUS	Broom			Diuretic and cathartic.
Decoctum Scoparii		30.0	℥ i	
SERPENTARIA	Virginia Snakeroot			
Ex. Serpentariæ Fl.		0.60—2.0	m 10—30	

Name	Common Name	Metric System	Apothecary Weight	Physiological Action,
Tinct. Serpentariæ		4.0—8.0	ʒ i—2	
SENNA	Senna			Efficient purgative; should be given with aromatic and saline substances.
Confectio Sennæ		3.90—7.80	ʒ i—2	
Ex. Sennæ Fl.		3.75—15.	ʒ i—℥ ½	
Infus. Sennæ Compos.	Black draught	120. —	℥ iv—	
Syrupus Sennæ		3.75—15.	ʒ i—℥ ½	
Pulvis Glycyrrhizæ Compos.		1.95—3.90	ʒ ½—℥ ½	
SODIUM	Sodium, metal			
Soda	A caustic solid			
Liquor Sodæ		0.30—0.90	m 5—15	
Liq. Sodæ Chlorate	Labbaraque's sol.	0.65—3.75	ʒ 1-6—1	Antiseptic and disenfectant.
Sodii Carbonas		0.65—1.95	gr 10—ʒ ½	An antacid in dyspepsia and uric acid gravel.
Sodii Bicarbonas		0.65—3.90	gr 10—ʒ i	Milder than the carbonate, useful in uræmia.
Sodii Acetas		1.30—7.80	gr 20—ʒ ii	Diuretic. Chiefly used for making acetic acid.
Sodii Benzoas		0.65—1.95	gr 10—ʒ ½	Has been used as antilithic.
Sodii Boras	Borax	1.95—2.60	gr 30—40	A germicide, a feeble emmenagogue.
Sodii Chloras		0.65—1.30	gr 10—20	Similar to chlorate of potassium but more soluble.

Sodii Phosphas		1.30—60.	gr 20—℥ 2	A mild delicate purgative.
Sodii Sulphas	Glauber's salts	15. —30.	℥ ½—1	An efficient cathartic, but disagreeable.
TARAXACUM	Dandelion			Slightly tonic, diuretic, aperiant.
Extractum Taraxaci		1.30—3.95	gr 20—ʒ i	
Ex. Taraxaci Fl.		3.75—11.25	ʒ i—3	
UVA URSI	Bearberry			Astringent, tonic, useful in catarrh of bladder.
Ex. Uvæ Ursi Fl.		1.90—3.75	ʒ ½—1	
VALERIANA	Valerian			Nerve stimulant and antispasmodic.
Oleum Valerianæ		0.24—0.30	m 4—5	
Ex. Valerianæ Fl.		3.75—	ʒ i—	
Tinctura Valerianæ		3.75—15.	ʒ i—℥ ½	
VERATRUM VIRIDE	American Hellebore			A powerful spinal and arterial depressant.
Ex. Veratri Veridis Fl.		0.06—0.30	m 1—5	
Tinct. Veratri Veridis		0.13—0.40	m 2—6	
VIBURNUM	Black Haw			Nervine, antispasmodic, diuretic tonic.
Ex. Viburni Fl.		1.90—3.75	ʒ ½—1	
XANTHOXYLUM	Prickly Ash			Stimulant, diaphoretic.
Ex. Xanthoxyli Fl.		1.90—3.70	ʒ ½—1	
ZINCUM	Zinc			
Zinci Oxidum		0.13—0.52	gr 2—8	Insoluble, tonic, astringent, exsiccant to excoriations.
Zinci Iodidum		0.03—0.13	gr ½—2	Alterative.
Zinci Sulphas	White Vitriol	0.06—1.95	gr 1—ʒ ½	Tonic, astringent; emetic in large doses.

Name	Common Name	Metric System	Apothecary Weight.	Physiological Action.
Zinci Valerianas		0.06—0.13	gr 1—2	Antispasmodic.
ZINGIBER	Ginger			Stimulant, carminative, sialagogue.
Ex. Zingiberis Fl.		0.60—1.25	m 10—20	
Tinct. Zingiberis		1.90—3.75	ʒ ½—1	

Incompatibles.

There are mainly three kinds of cases where, by improper associations, medicinal chemicals may become incompatible.

1.—When free acids are combined with hydrates or carbonates.

2.—When two or more soluble salts are associated, which, by interchange of bases or acid, give rise to the formation of new compounds with different properties and therapeutical action; and

3.—When chemicals are brought in contact which may give rise to sudden and vehement or explosive chemical processes.

Table showing approximate number of drops in a fluid drachm of various liquids, also the weight of one fluid drachm in grains.

Liquid.	Weigt of f℥i in grains.	Drops in f℥i ♏ 60.
Acetum Opii	61	90
Acetum Scillæ	57	68
Acidum Aceticum	58	108
Ac. Acetic dil	55	68
Ac. Carbolicum	59	111
" Hydrochloricum	65	70
" Hydrocyanicum	54	60
" Lactic	66	111
" Nitric	77	102
" Nitric Hydrochlor	66	76
" Phosphor dil	57	59
" Sulph. arom	53	146
" Sulph. dil	58½	60
Alcohol	44	146
Aqua	55	60
Aqua Distillata	53½	60
Chloroform Pur	80	250
Copaiba	51	110
Creosote	56½	122
Ex. Belladon Fl	57	156
" Buchu "	47½	150
" Digitalis "	62	134
" Ergotæ "	60	133
" Ipecac "	60	120
" Rhei "	61	158
" Senegæ "	62	137
" Valerianæ "	49	150
" Zingb "	48	142
Glycerinum	68	67
Liq. Acidi Arseniosi	55	57
" Ferri Chloridi	72	71
" Iodidi Compos	59	63
" Potassæ	58	62
" Zinc Chloridi	88	89
Oleum Anisi	54	119
" Bergamii	46	130
" Cari	50	132
" Juniperi	49	148

Liquid.	Weight of f℥i in grains.	Drops in f℥i m 60.
Oleum Limonis	47	129
" Ricini	51½	77
" Rosæ	47	132
" Terebinth	45½	137
" Tiglii	50	104
Spt. Ætheris Comp	45	148
Spt. Ætheris Nitrosi	47	147
Spt. Camphoræ	47	143
Syrupus Simplex	72	65
" Acaciæ	73	44
" Ferri Iod	77	65
" Scillæ	74	75
" Scillæ Comp	70	102
" Senegæ	70	106
Tinctura Aconiti	46	146
" Belladonnæ	53	137
" Benzoini Comp	48	148
" Cantharidis	51	131
" Digitalis	53	128
" Ferri Chlor	53	150
" Iodi	47	148
" Opii	53	130
" Opii Com	52	130
" Opii Deodor	54	110
Vin. Colchici Rad	55	107
" Colchici Sem	54	111
" Opii "	55	100

Times For Administering of Medicines, Etc.

Alterna nocte	alt. noct.	Every other night.
Alternis diebus	alt. dieb.	Every other day.
Ante cibum	a. c.	Before food, meals.
Bis die	b. d.	Twice a day.
Hac nocte	h. n.	To-night.
Horæ somni	h. s.	At bed-time.
Mane	m.	In the morning.
Nocte	n.	At night.
Nocte maneque	n. mque.	Night and morning.
Omni mave	o. m.	Every morning.
Omni nocte	o. n.	Every night.
Post cibum	p. c.	After food, after meals.
Post singulas liquidas sedes.	post. sing. liq. sedes.	After every loose motion.
Pro re nata	p. r. n.	As circumstances require.
Primo mane	p. m.	The first thing in the morning.
Quotidie	quotid	Every day.
Quaque hora	quaque hora	Every hour.
Si opis sit	s. o. s.	If necessary.
Sumendum	s.	To be taken.
Statim	stat.	Immediately.
Ter die	t. d.	Three times a day.
Tussi urgente	t. n.	When the cough is troublesome
Utendum	u.	To be used.
Vespere	vesp.	In the evening.
Vices	vic.	Turnis (ad vices quatuor, for four times).

TEMPERATURE.

Table of Temperature.

Hyperpyrexia.	106° and over extremely dangerous.
High Fever.	103 1-2°—106°
Moderate Fever.	101°—103 1-2°
Subfebrile.	99 1-2°—101°
Normal,	98°—99 1-2°
Subnormal.	97°—98°
Collapse.	95°—97°
Algid Collapse.	Below 95° again extremely dangerous.

Normal Temperature.—The average normal temperature in adults is 98.4°-98 6° Fahr. There is a diurnal variation of sometimes 1.5°, the highest point being reached in the evening. Exercise, diet, climate and sleep cause deviation from the standard.

Important to Notice.—The importance of noticing the first variation from the known normal temperature cannot be overestimated. A slight deviation for a day from the healthy degree is of no special importance, but should the temperature on the morning of the second day be higher than on the morning of the first, and by noon a little higher still, there is probably something wrong, and the patient should be guarded from fatigue and exposure and be carefully watched. If the rising temperature does not show what the disease is, it does show what it probably is not. For instance, a rapid temperature of three or four degrees above the healthy standard does not mean typhoid fever, but may mean measles or scarlet fever; and in whooping

cough and small pox, the high temperature precedes those diseases from two to four days. In diphtheria, there is this rise before any one thinks of looking at the throat. Increase of temperature calls for cooling remedies, external and internal, and decrease of temperature below the average requires warming and sustaining treatment.

An Increase of Temperature, beginning each day a little earlier, is a bad sign; one beginning later promises well.

A Decrease of Temperature, beginning each day earlier, is a good sign, but if later each day is a bad indication.

The Duration is another important thing to consider; a long-continued high temperature without a fall is a bad sign; a long-continued lower temperature is an encouraging thing.

A Very High Temperature, say 105°, is dangerous in itself, but more so if it has come on gradually as the last of a progressive series, the temperature having grown daily higher by half a degree or more.

Temperature Below Normal.—A fall of temperature below normal is far more dangerous than a much greater corresponding rise; one degree below is more an indication of a bad condition than are two and a half above the normal.

Temperature as a Test of Nourishment.—In convalescence, if there is no rise of temperature after eating, there is no nourishment secured from the food; if there is a sudden or high rise above one degree, the food was too stimulating or bulky. To be beneficial in convalescence, food must increase the temperature a quarter to half a degree, and this must almost subside

when digestion is over, though leaving a gradual improvement in the average daily temperature.

Pulse and Temperature.—Aitken lays it down as a rule that an increase of temperature of one degree Fahrenheit above 98° corresponds with an increase of ten beats of the pulse per minute, as in the following table:

A temperature of	98°	corresponds	to a pulse of	60
"	99°	"	"	70
"	100°	"	"	80
"	101°	"	"	90
"	102°	"	"	100
"	103°	"	"	110
"	104°	"	"	120
"	105°	"	"	130
"	106°	"	"	140

CLINICAL THERMOMETERS (and uses.)

Object and Uses.—The object generally in view with clinical thermometers is to know as nearly as possible the temperature in the anterior of the body, or the blood heat. The localities most suitable for applying the thermometer would be the natural cavities or the openings by which a thermometer might be introduced to a certain depth in the interior of the body, such as the rectum or vagina. The temperature is not subject in those places to the ordinary changes acting from without, and the time required for taking an observation with the thermometer in any of those localities would be only such as is necessary for raising the temperature of the mercury to that of the surrounding mucous membrane, or about five minutes.

The case is very different if we take the temperature in a cavity of the body that is not always closed, such as the mouth or the axilla, which can be formed into a closed cavity only by placing the arms closely against the chest. In those places the time required for an observation is much longer, because the temperature of the mucous membrane of the mouth or of the skin of the axilla, begins itself, slowly rising after the closing of these cavities, until it is raised to that of the deeper tissues, which are not exposed to the loss of heat from without, whereas from nine to eleven minutes are reduired for an observation of the temperature in the mouth; ten to twenty may be necessary for the mercury to become stationary in the axilla.

Rectum.—The rectum gives the most reliable temperature, as there are fewer possible sources of error. Remember that if the rectum contain fæcal matter the index will not reach so high a point as if the bulb comes directly in contact with mucous membrane. In using the rectum care must be taken not to let a small instrument slip into it, and in restless children to prevent the instrument from being broken. This is best prevented by placing the patient on his side, and while the thermometer is kept "*in situ*" with one hand, letting the other one rest on the hip of the patient, in order to be able to at once arrest any turning movement which he might happen to make. The thermometer ought to be introduced about two inches deep in the rectum, and may, before being taken out, be gently pushed forward a little more in order to bring the mercury in contact with a fresh part of mucous membrane which has not been cooled by bulb of thermometer.

Axilla.—Keep the patient well covered up for some

little time before taking an axillary temperature. The part should not have been expcsed for washing or dressing at least half an hour previously, the axilla must be first dried from perspiration and the thermometer held firmly in position. In a very emaciated or very restless subject it may be impossible to get a correct axillary temperature.

Mouth.—The temperature is frequently taken by mouth, the bulb of the thermometer being placed under the tongue, but this is not always safe, as there is danger that a child or an irresponsible patient may bite off the bulb. The lips must be kept closed during the process.

Other Places of Application.—Other places of application, such as the fold of the skin between the thumb and second metacarpus may be used for special, but are quite unsuitable for general clinical purposes.

Care of Thermometers.—Thermometers ought to be carefully compared from time to time with a standard thermometer, as they are liable after a certain time to give abnormally high indications, owing to the bulb generally contracting a little.

RELATIONS BETWEEN THERMOMETERS.

Fahrenheit's.—In Fahrenheit's thermometer the freezing point is placed at 32° and the boiling point at 212°, and the number of intervening degrees is 180.

Centigrade.—The Centigrade thermometer, which is now recognized in the U. S. Ph., and has been adopted generally by scientists, makes the freezing point zero and the boiling point at 100°.

Reaumur's.—In Reaumur's thermometer the freezing point is at zero and the boiling point at 80°.

De Lisle's. — In De Lisle's thermometer, used in Russia, the graduation begins at the boiling point, which is marked zero, while the freezing point is placed at 150°. It will be convenient for quick reference to give the corresponding degrees of Fahrenheit and Centigrade scales in that range with which human physiology is concerned:

Fahr.	Cent.	Fahr.	Cent.
95.0	35.0	104.0	40.0
96.0	35.55	104.9	40.5
96.8	36.0	105 0	40.55
97.0	36.11	105.8	41.0
98.0	36.66	106.0	41.11
98.6	37.0	106.7	41.5
99.0	37.22	107.0	41.66
99.5	37.5	107.6	42.0
100.0	37.77	108.0	42.22
100.4	38.0	108.5	42.5
101.0	38.33	109.0	42.27
101.3	38.5	109.4	43.0
102.0	38.83	110.0	43.33
102.2	39.0	111.2	44.0
103.0	39.44	112.1	44.5
103.1	39.45		

THE PULSE.

Pulse.—Each contraction of the heart, by throwing the contents of the left ventricle into the Aorta, causes a sudden change in the fullness of the systemic arteries, which is manifested by elongation and dilatation of

these vessels. When the finger is placed on any artery which runs on a resting plane, such as radius (from beneath the radial artery at the wrist), slight compression by the finger enables us to detect an increased hardness or fullness, or, in other words, this change in the distention of the artery constitutes the pulse.

Pressure.—The amount of pressure required to flatten the artery completely is the rough and ready way of estimating its fullness or tension, and is best performed by compressing the vessel with the index finger, whilst the middle and ring fingers, placed more distant from the heart, check off the pressure required to stop the blood-flow. For the sake of convenience, the radial artery is chosen to detect the precise character of the pulse; these characters relate to the number of pulsations in a given time, to their degree of quickness, hardness and strength, to the equality or inequality either of the pulsations themselves or of their intervals, to the development or fullness of the artery, and to the different impressions it may make on the finger.

The heart determines the frequency, rhythm and force of the beats, and to it are traceable any deviations from the normal in respect to these elements in the production of the pulse.

The vessels determine the size of the channel by which the blood driven into the Aorta at each systole reaches the capillaries, and therefore the rate of its flow, and the duration of the pressure, *i. e.*, the character of the individual pulsations.

The following is a tabular view of the variations from the normal pulse, referred to the heart and arteries respectively.

- Heart.
  - Frequency.
    - Frequent.
    - Irregular.
  - Rhythm.
    - Irregular.
    - Intermittent.
  - Force.
    - Excessive.
    - Defective.

- Arteries.
  - Relaxed.
    - Large.
    - Short.
    - Low Tension.
  - Contracted.
    - Small.
    - Long.
    - High Tension.

The following are the names applied to the different pulsations:

Pulse Ardent.—One which seems to raise itself to a point in order to strike the finger.

Pulse Deep.—One which cannot be felt without difficulty and without strong pressure of finger.

Pulse Dicrotic.—That in which the finger is struck twice at each pulsation, one lightly, the other time more strongly.

Pulse Feeble.—One which strikes the finger feebly.

Pulse Frequent.—One which strikes more frequently than usual in a given time.

Pulse Full.—One which gives the notion of vascular repletion.

Pulse Hard.—That in which the pulp of the finger seems to yield to the pulsations.

Pulse Intermittent.—One in which the pulsation fails from time to time.

Pulse Irregular.—One whose pulsations are unequal and return at unequal intervals.

Pulse Large.—That which is large and full.

Pulse Natural.—One that is equal and regular in strength and frequency, compressible and devoid of hardness.

Pulse Quick.—One which strikes sharply, but not forcibly, against the finger.

Pulse Regular.—One whose pulsations are equal and succeed each other at equal intervals.

Pulse Strong.—One which strikes the finger strongly.

Pulse Small.—One whose pulsations are slender and weak.

Pulse Undulating.—One which resembles in its movements those of the waves.

The following estimates have been made of the pulse at various ages:

In the embryo,	150	pulsations	per minute.
At birth,	130 — 150	"	"
One month,	120	"	"
One year,	108 — 120	"	"
Two years,	90 — 115	"	"
Three years,	80 — 100	"	"
Seven years,	72 — 90	"	"
Twelve years,	70	"	"
Puberty,	80	"	"
Adult age,	70 — 75	"	"
Old age,	50 — 65	"	"

BATHS AND BATHING.

Baths.—Nothing is more important in preserving the health and promoting the recovery from disease

than daily bathing. All the vital organs are affected through the skin, and by keeping it in a healthy condition the circulation of the blood, the action of the kidneys and bowels, and all the digestive processes, are promoted, many diseases warded off and the assimilation of food aided. The nurse should always ask the physician what kind of bath to give, and also what temperature it should be, as harm often results from ignorance in the matter.

Baths may be regarded as simple and composite, medicated or artificial; they may be used in the form of liquid, vapor or air. We shall consider them under these heads in the following description:

Temperature of Baths.

Cold Bath,	50°	to	60°	Fahr.
Tepid Bath,	85°	"	96°	"
Temperate Bath,	75°	"	85°	"
Warm Bath,	96°	"	98°	"
Hot Bath,	98°	"	110°	"

Cold Bath.—By the cold bath is meant the immersion of the body in water below the temperature of 60°; anything below 50° is considered too cold a bath. The first effect of the bath is a sensation of cold amounting to shivering, with slight gasping for breath; if the bath is continued for more than two or three minutes the temperature of the skin is diminished, and if it is protracted the blood and the subjacent tissues lose a little heat, but this does not generally occur till after quitting the bath; if the cold is intense and prolonged there is a certain degree of numbness of the skin, while the pulse may become small and may fall from ten to twenty beats a minute after a short time (the colder

the water the shorter); reaction takes place, bringing redness to the skin, an increase of temperature, with a certain amount of excitement; but if the bath be continued the depression returns, in its more remote effects. The cold bath accelerates the transmutation of tissues, augmenting the excretion of carbonic acid and urea from the system, and as a consequence increasing the appetite.

Warm Bath.—A warm bath produces no shock to the system, but causes a moderately increased flow of the circulating fluid to the surface, augmenting the frequency of the pulse, and scarcely affects the respiration. There is not the depression or excitement of a cold bath; it rather retards the transmutation of tissues.

Hot Bath.—With a hot or very hot bath the central nervous and circulatory systems are more affected; the frequency of the pulse increases greatly, the respiration becomes anxious and quickened, the skin is in a hyperæmic condition and a free perspiration breaks out.

Tepid Bath.—Tepid baths are intermediate between cold and warm; neither the pulse nor the excretion and secretion are effected, as no heat is confined in the system or taken from it; no reaction takes place, and the animal is unaltered.

Douche Bath.—The term is applied to a column of fluid of a determinate nature and temperature let fall upon the body. In using this kind of bath the fluid is directed upon the part on which the physician is desirous of acting. The apparatus consists of a reservoir of water, having a pipe or plug, by means of which the water can be directed as desired. The douche

communicates a considerable and peculiar shock to the nervous system and is one of the most successful means for taming the furious maniac. It is also useful in chronic rheumatism, stiff joints, etc.

Sponge Bath.—Tepid sponging gives great comfort and relief in very many forms of illness, and especially in fevers. It is most effectually and easily accomplished in the following way, viz.: A piece of rubber sheeting having been placed over the mattress or bedding, a warm blanket is spread out underneath the patient; the clothing is then removed from the whole body and the entire surface quickly sponged over (passing the sponge always from above downwards) with tepid water, to which a little cologne or aromatic vinegar may be added. After sponging the sides off, the under blanket should be quickly folded over the still wet skin, the bed clothes replaced and the patient allowed to remain undisturbed, except for the taking of nourishment, for half or even an hour, when the night-dress can be put on (having been warmed) and the bed arranged as usual.

Sitz Bath.—The sitz bath of the hydropathist is a tub of cold water in which the patient sits for a variable period.

Cold Wet Pack.—This is a valuable means of treatment in fevers and in some other acute diseases. It is accomplished as follows: The mattress must be covered with a rubber cloth, and two strong binders are then to be laid across the bed, with their ends hanging over the bedside; a thick blanket is now arranged on the bed, and upon that a large linen sheet, which has been wrung as dry as possible out of cold water. The patient, stripped of all clothing, is placed

upon the wet sheet, which is folded over and tucked well and evenly under the shoulders and body so as to cover him completely from the neck downward. The blanket is next drawn over the sheet and tucked evenly under the patient on both sides The nurse then passes his hands under the feet and lifts them up and tucks back the lower ends of the sheet and blanket under the heels. The binders are now tied around the patient and four or five blankets placed over the whole and pressed close to the sides. The application should never be continued for more than an hour, for fear of exhaustion. Draughts of cold water may be given from time to time to promcte perspiration. On the pack being removed the body must be quickly sponged over with tepid water and dried with a soft towel and wrapped in a warm, dry blanket for some hours. The cold pack is sometimes used to lower excessive heat. It should then be used without additional blankets.

Half Pack.—The half pack is more readily applied and less exhausting than the ordinary wet pack, and is invariably useful in case of children, who almost always fall asleep in it. To prepare it two towels are folded lengthwise, dipped in cold water and tightly wrung. The patient, stripped of clothing, lies on a dried blanket, one of the wet towels placed beneath and the other over the body, or from the armpits to below the hips, while the arms and legs remain free from restraint, or one towel may only be used and simply laid across the bowels. The blanket is then quickly folded over the patient, its edges being evenly and securely tucked in, the bedclothes are replaced and one or two extra blankets are added. The patient should

never remain in this pack more than an hour, and when removed the body should be sponged and dried in the same manner as after the ordinary wet pack.

Alkaline Bath.—

℞

Crystallized Carbonate Soda, ℥vi.
Water, Cxxv.

Alkaline baths are used in a great variety of cutaneous affections.

Corrosive Sublimate Bath.—

℞

Corrosive Sublimate, ℨiii.
Hydrochloric Acid, ℨi.
Water, Cxxx.

Baths of corrosive sublimate are occasionally employed in some skin affections and in secondary syphilis.

Sulphuret Potassium Bath.—

℞

Sulphuret Potassium, ℥vi.
Water, Cxxv.

A little dilute sulphuric acid is sometimes added. These baths are extensively employed in the treatment of cases of skin diseases.

Bran Bath.—Put bran enough in bath to make it milky. This bath is used for softening the skin when it is dry and flakey. It should never be used in stationary tubs, for in letting off the water the bran will be sucked down and will choke the pipe.

Salt Bath.—Put in a pound of rock salt to four gallons of water; increase salt in proportion to water. This bath is useful in invigorating feeble constitutions.

Fucus Bath.—This is made by adding a decoction of sea weed, chopped up, to an ordinary bath. It will become more or less gelatinous if enough be added. Such baths go popularly by the name "Ozone" baths, and they contain a certain amount of chloride sodium and a minute proportion of iodine.

Balsam of Pine Bath.—Baths of the balsam of pine leaves may be prepared by adding one pound of the extract to twenty-five gallons of water. The extract dissolves in the bath, which is then ready for use. These baths are slightly stimulant, and are frequently employed in hysterical, rheumatic and gouty affections.

Mustard Foot Bath.—Mustard foot baths are employed with a view to a revulsive and counter-irritant effect. To prepare a mustard bath, two tablespoonfuls or more of mustard should be tied in a cloth and agitated well with cold water; then hot water may be added to make the bath. It is found by experiment that cold extracts the active principle or volatile oil far better than very hot does.

Vapor Bath.—A vapor bath is one in which the skin is exposed to the action of hot water presented in the form of vapor. The vapor bath may be taken in a box, with the head included or not, or in the more common form of Russian or Turkish baths, where a large room is filled with vapor, and where, therefore, the vapor is inhaled, or from vapor obtained from a small but suitably constructed apparatus, which vapor may be diffused over the whole body or directed to a particular part. A very simple apparatus may be prepared by placing under a chair a shallow earthenware or metallic pan containing boiling water to the depth of three or four inches, and from which abundant vapor

may be obtained by placing it on one or two red-hot bricks. The patient, sitting on a chair surrounded by blankets and other suitable covering, will receive the full benefit of a vapor bath. In such a bath a heat of more than 122° Fahr. is not borne comfortably.

Mercurial Vapor Bath.—Very similar is the mode of applying the fumes of mercury. Under the chair are placed a copper bath containing water and a metallic plate on which are put from 60 to 180 grains of the bisulphuret, or of the grey or red oxide of mercury. Spirit lamps are lighted under the bath and under the plate. The patient then experiences the benefit of both an aqueous and mercurial vapor. At the end of five or ten minutes perspiration commences, which becomes excessive in twelve or fifteen minutes. The lamps are then to be extinguished, and when the patient becomes moderately cool he is to be rubbed dry. He should then drink some warm liquid and remain quiet for some time.

Calomel Vapor Baths.—Calomel, in quantities from 20 to 30 grains, is administered in a similar manner.

Hot Air Bath.—There are two forms in which the hot air bath is administered, according as the patient does or does not breathe the heated air. The action of the latter closely resembles the vapor bath, but differs from it by not impeding the respiration, as the latter does by depositing moisture in the bronchial tubes. The lungs, instead of requiring to heat up the inspired air, are subjected to a temperature above their own. Hot air baths favor the highest degree of respiration, while the moisture of vapor baths somewhat retards it

If they are hot they raise the temperature of the body by several degrees.

A great variety of apparatus having been invented for the purpose of giving these baths to bed patients, it is sufficient for ordinary purposes to mention and describe this method. The patient is stripped of all clothing and laid upon a blanket in bed, a cold, wet towel being wound turban-like around his head; the body cradle is then placed upon the bed and blankets thrown over it so as to envelop patient from feet to the neck, and the lamp is then lighted and placed on any article of furniture which will raise it to the required height, its tube being inserted under the blanket, so that the air may enter above the body, the bath to be continued for length of time directed. The patient should not be left alone while in this bath. Where perspiration does not speedily take place, the body may be sponged with tepid water and the apparatus reapplied without drying the surface.

Sulphurous Acid Air Bath.—A valuable mode of applying sulphur in the form of a bath is by using its fumes—in other words, sulphurous acid. The patient is seated on a cane bottomed chair and his body is encircled with a cradle, over which oil cloth is thrown, the head remaining uncovered. Sulphur is placed on a metallic plate, to the lower surface of which the flame of a lamp is applied, when sulphurous acid is disengaged.

Electric Bath.—Consists in placing the person on an insulated stool, communicating by a metallic wire with the principal conductor of the electrical machine, in action. The electric bath produces general excitement

of all the functions, and especially of the circulation and secretions.

Solar Bath.—The body is exposed to the rays of the sun, but the head and face must be protected by covering.

MASSAGE.

Massage is one of the oldest and most valuable modes of treatment, and though for the most part undertaken by professional rubbers, it occasionally becomes one of the duties of a nurse, and therefore should always form part of his practical training. It consists essentially in pinching the skin and kneading the muscles of the whole body in a systematic manner, and its uses are to strengthen the muscles and to stimulate the action of the skin and the various internal organs, especially those concerned in digestion, the stomach, liver and bowels. In a modified form it is also frequently prescribed for the purpose of promoting the absorption of inflammatory and other exudations.

For the convenience of those who may not have had the advantage of receiving practical instruction, the process recommended by Dr. Weir Mitchell in cases of nerve prostration will be briefly described.

How Applied.—An hour is chosen between two meals, and, the patient lying in bed, the nurse starts at the feet and gently but firmly pinches up the skin, rolling it lightly between the fingers, and going carefully over the whole foot; then the toes are bent and moved about in every direction; and next with the thumb and fingers the little muscles of the foot are kneaded and pinched more largely, and the inter-osseous groups worked at

with the finger tips between the bones. At last the whole tissues of the bones are seized with both hands and somewhat firmly rolled about. Next the ankles are dealt with in like fashion, all the crevices between the articulatory bones being sought out and kneaded, while the joint is put in every possible position. The leg is next treated, first by surface pinching and then by deeper grasping of the areolar tissue, and last by industrious and deeper pinching of the large muscular masses, which, for this purpose, are put in a position of the utmost relaxation. The grasp of the muscles is momentary, and for the large muscles of the calf and thigh both hands act, the one contracting as the other loosens its grip. In treating the firm muscles of the front of the leg the fingers are made to roll the muscles under the cushions of the finger tips. At brief intervals the nurse seizes the limb in both hands and lightly runs the grasp upwards, so as to favor the flow of venous blood currents, and then returns to the kneading of the muscles.

The same process is carried on in every part of the body, and especial care is given to the muscles of the loins and spine, while usually the face is not touched. The belly is first treated by pinching the skin, then by deeply grasping and rolling the muscular balls in the hands, and at last the whole belly is kneaded with the heel of the hand in a succession of rapid, deep movements passing around in the direction of the colon.

Degrees of Application, and Effect. — It depends very much on the strength, endurance and practice of the manipulator how much good is done by these manœuvers. At first, or for a few sittings, they are to

be very gentle, but by degrees they may be made more rough without hurting the patient.

Length of Each Application.—The early treatment should last half an hour and should be increased by degrees to one hour, after which should follow an hour of absolute repose. After the first few days keep the part lubricated with vaseline, so as to make the skin smooth and supple.

Care After Treatment.—As soon as a part has become manipulated it should be at once wrapped up. When the patient becomes used to the process the operator is sometimes directed to strike the muscular masses with the soft cushion formed by the muscles on the ulnar side of the closed hand, or with some part kept in rigid extension. The blows, if given adroitly, cause a momentary contraction of the muscles thus struck.

Duration of Treatment.—The daily massage is kept up at least six weeks, and then if everything is going along well the nurse is directed to spend half of the hour in exercising the limbs, after the Swedish plan, by making a movement of flexion and extension, which the patient is taught to resist.

Alternate Treatment.—At the seventh week the treatment is used on alternate days, and is commonly laid aside when the patient gets up and begins to move about.

FRICTION.

Friction.—By friction, or, as it is sometimes called, medical rubbing, we mean surface rubbing, as distinguished from massage, a process by which deep pressure is made upon the muscles.

Uses.—Friction is usefully employed over the surface of a limb or the trunk for a variety of purposes. It is especially useful when the circulation is enfeebled, either by extreme application of cold, amounting when in a severe degree to frost bite, or in cases of paralysis. The effect is still further increased by the use of various stimulating linaments and embrocations, more especially when it is desirable to excite a certain amount of counter-irritation over a large cutaneous surface of congestion or inflamation of internal organs.

Another Object.—Another object with which friction is largely employed in medicine is to facilitate the absorption and introduction into the system of various remedial agents applied externally instead of being administered internally by stomach. By this means gastric irritation and disturbance are avoided, and the effects of the remedies upon the system can be more closely watched and regulated.

Application of Mercury.—In this way mercury is frequently introduced into the system by the process commonly spoken of as rubbing in, and salivation can be more easily avoided or checked at its commencement than when mercury is administered by the mouth. The part of the body selected for this purpose is along the inner side of the thigh up to the groin, and mercury rubbed in, in the form of ointment, night and morning, will generally affect the system in a few days.

CATAPLASMS.

Uses.—Cataplasms or poultices are soft, moist applications, usually applied hot, but sometimes cold. They may be used merely as a means of supplying heat and

moisture or may contain some drug intended to exert a specific effect.

Application.—When a poultice is to be applied the nurse should get his patient ready first. If he has a wound it should be thoroughly washed and lightly covered antiseptically; then poultice should be made quickly and applied as warm as patient can bear it.

A poultice should be changed every two or three hours by day and every four by night.

Cataplasma Lini (Linseed Meal Poultice).— Heat the basin in which poultice is to be made with boiling water; then empty it and put in again as much boiling water as may be necessary to make the required poultice; sprinkle the meal into the water, stirring vigorously, till a proper consistency is attained; lastly stir in a small quantity of olive oil. By adopting this plan poultice will be free from lumps.

The poultice should be spread on a square piece of muslin, four times the size of poultice required, with a spatula, on a board especially used for that purpose. When poultice is spread turn the spare muslin sides over each other and then the two ends in like manner. This method helps retain the heat by increasing the covering on top and having only a single layer of muslin on bottom or side applied to surface of body. It must be of uniform thickness, and neither so thick as to be too heavy nor so thin as to dry or cool rapidly.

Cataplasma Carbonis (Charcoal Poultice).—Take of wood charcoal in powder half an ounce, crumb of bread two ounces, linseed meal one ounce and a half, boiling water ten fluid ounces; macerate the bread in the water for ten minutes near the fire; then mix and add the linseed meal, gradually stirring the ingredients,

that a soft poultice may be formed; mix with half the charcoal and sprinkle the remainder on the surface. Charcoal recently prepared has the property of absorbing those principles upon which the offensive odor of putrefying animal substance depends.

Cataplasma Fermenti (Yeast Poultice).—Beer yeast six parts, flour fourteen parts, water temperature 100° Fahr. six parts; mix and place mass near the fire till it rises; apply while fermenting. Is used to hasten the separation of gangrenous sloughs.

Cataplasma Panis et Lactis (Bread and Milk Poultice).—Take the inside of a loaf of stale bread; crumble it well up in eight or ten ounces of sweet milk; after soaking a few minutes let it come to a boil, and then stir in a bit of lard, or a few drachms of sweet oil. This poultice must be changed quite often, as from heat, etc., of the inflamed part the milk soon becomes rancid.

Cataplasma Panis (Bread Poultice).—Bread poultice should be made first by grating a sufficient quantity of stale bread crumbs; this should be added to boiling water in a basin, carefully stirring all the while, until a proper consistency is obtained; the resulting mass should be poured on to the muslin prepared to receive it, and should not be spread or pressed in any way.

Cataplasma Lonii (Hemlock Poultice). — Juice hemlock one ounce, linseed meal four ounces, boiling water ten ounces; evaporate the hemlock juice to half its volume; add this to the linseed meal and water previously mixed, and stir them together.

Cataplasma Sodæ Chlorinatæ (Chlorine Poultice). Take of solution of chlorinated soda two fluid ounces, linseed meal four ounces, boiling water eight fluid ounces; mix the linseed meal gradually with the water

and add the solution of chlorinated soda, with constant stirring.

Cataplasma Danci (Carrot Poultice).—Boil carrots until soft, strain, mash and apply warm. Is slightly emollient in flabby and foul ulcers.

Cataplasma Capsici (Cayenne Poultice).—Take of powdered ginger two ounces, powdered cloves and cinnamon each one ounce, cayenne pepper two drachms, tincture ginger half an ounce, honey sufficient quantity; mix the powders, add the tincture and a sufficient quantity of honey to make the proper consistency for a stiff poultice. Action slightly irritant.

Cataplasma Sinapis (Mustard Poultice).—Take of mustard in powder two and a half ounces, linseed meal two and a half ounces, boiling water, luke warm water, of each a sufficiency; mix the mustard with two or three ounces of luke warm water; mix the linseed meal in from six to eight ounces of boiling water; add the former to the latter and stir them up together. The poultice should be thickly spread on muslin, and care must be taken to prevent its adhesion to the skin. The nurse must have time specified, from physician, that poultice is to remain applied on patient, as it is a very powerful rubefacient.

Cataplasma Aceti (Vinegar poultice). — Linseed meal or bread crumbs in sufficient quantity, with vinegar. Applied cold, for sprains, etc.

Cataplasma Stupa (Oakum Poultice).—Take a sufficient quantity of oakum, loosely picked, and place in a thin piece of muslin and wrap loosely up; then immerse the whole in boiling water. It is then wrung out and covered by a thin layer of muslin, and is thus to be applied to the member diseased.

Cataplasma Aluminis (Alum Poultice).—Alum ʒi, white of two eggs; agitate together till a coagulum is formed. The alum curd is commonly made by rubbing up the white of eggs briskly with a lump of alum. Astringent. Applied between fine linen to inflamed eyes; also to chilblains.

Cataplasma Aqua Astrica (Ice Poultice).—A bladder half filled with small pieces of ice, for application to the head in congestion.

FOMENTATIONS.

Fomentations.—Fomentations or stupes is the application to the surface of the body of flannel cloths or sponges, moistened with hot water, either pure or containing some medicinal substance in solution. The action of the simple fomentation is the same as that of a poultice. By its warmth and moisture it tends to relax the muscular fibres of the skin and soften the cuticle, thus relieving tension and diminishing pain and irritation. A fomentation is superior to a poultice in lightness and cleanliness, but unless care be taken it loses its heat more quickly. This disadvantage may be overcome by covering the fomentation with a thick layer of cotton wool, but, whatever means be taken to retain its heat, it can only be kept above the temperature of the body a few minutes. If, therefore, the full effect of fomentation is desired to be obtained, the flannel must be changed every twenty minutes.

How Applied.—A fomentation is thus applied: A piece of coarse flannel, or of spongio-piline, sufficiently large to cover the affected part, when folded into two layers, is put into a basin and boiling water is poured upon it. It is then lifted from the basin with a pair

of tongs or with some convenient instrument and dropped on the wringer. This is a short piece of toweling with a stick attached at each end. The sticks then being twisted in opposite directions, as much water as possible is squeezed out of the flannel, which is then immediately applied to the affected part.

Poppy Fomentation.—Take two poppy-heads, break them up and boil in two pints of cold water until the quantity is nearly reduced to one pint. Then strain, soak the flannel in the decoction, wring out superfluous moisture and apply hot.

Turpentine Fomentation.—The flannel should be wrung out of hot water, and then the surface should be sprinkled with about half or an ounce of turpentine.

Opii Fomentation.—The same as turpentine, with the substitution of laudanum for turpentine.

COLD APPLICATIONS.

Cold. — When cold is applied persistently to any part it acts as a direct and very powerful depressant, of varying power, according to its intensity. It is therefore used locally to reduce inflammation, especially when the latter is of an acute type. In this employment of cold care must be exercised not to carry its use too far. Indeed, it is possible to convert an inflammation into gangrene by the too energetic employment of this agency.

Extreme Cold.—Extreme cold diminishes the sensibility of the tissues and freezing destroys it. Returning sensation is accompanied by pain. There are several means of producing these effects for surgical purposes. Of these the first is the application of a

freezing mixture of coarse salt and pounded ice to the part that is to be frozen.

Volatile Fluids. — Volatile fluids, when rapidly evaporated, may be used to produce extreme degrees of cold.

Ether.—Ether thrown in fine sprays upon the surface of the skin cools it, and if the surrounding atmosphere be dry enough to cause rapid evaporation, may freeze it, but moisture is apt to form in sufficient quantity to prevent its full effect.

Cold Effusion.—Cold effusion from a height materially helps to strengthen the weakening which happens to joints after long disuse, subsequent to splinting for fractures, dislocations, etc.

Hœmorrhoids.—Cold effusion at least acts as a palliative, and should be emplcyed after every stool.

Local Application.—Locally, cold is generally employed by means of cold water, compresses, irigation with cold water and the application of pounded ice, either enclosed in India rubber bags or in the form of an ice poultice. Ice is best applied in a rubber bag. These come in different shapes, to fit the various parts of the body. The bag should not be more than half filled with bits less than an inch square, and the supply be renewed before the last piece be melted. The ice will keep longer if mixed with one-third sawdust. Put a fold of muslin between ice bag and skin.

A mixture made of spirits of wine and water, or of Eau de Cologne with water, is a simple form of cooling lotion. The spirit evaporates and so carries heat from the surface. One oz. of rectified spirits to fifteen of water makes a good spirit lotion. The addition of four

drachms of nitrate of potash or chloride of ammonium will add to its cooling and sedative effect.

Refrigerants.—These lotions, applied by means of a soft rag or piece of lint over the skin, act as refrigerants, cooling the head when it is hot and painful, reducing heat and arterial excitement in tumors or contusions, and tending in the latter to promote the absorption of effused blood.

CUPPING.

Application.—The operation requires a good deal ef nicety in its performance, and is by no means so easy as it would appear. If the ordinary glass cups are used it will be necessary to exhaust the air by means of the flame of a spirit lamp, or, as preferred by some physicians, by inserting pieces of paper or cotton wool dipped in alcohol and then setting them on fire in the cup itself. Whichever method is employed, care must be taken not to heat the glass too much, or the patient's skin will be scorched. When the cups are fitted with an exhausting rubber ball the operation is more easily performed.

Dry Cupping.—Whether the cupping is to be "dry" or "wet" the surface of the body should be sponged with warm water prior to the operation and the cups be placed in a basin of hot water before being used. The flame being then held beneath the cup, so that it enters without touching the glass, the air becomes rarified, and the cups should be immediately applied to the skin, and gently pressed on it, so that the surface may fit closely to the edges.

Cup With Exhausting Rubber Ball,

Wet Cupping.—Wet cupping is always attended to by the physician. A scarificator, lint and adhesive straps will be required, in addition to the articles already mentioned. After cupping in the usual manner the scarificator will be employed, making a series of slight cuts. The glasses will then be replaced. When sufficient blood has been extracted the hæmorrhage can easily be stopped with pads of lint and adhesive plaster.

Where Applied. — Cupping glasses should be applied where skin is thick and cushiony, as over the loins, nape of the neck, pectoral region of the chest, etc., and not where bony prominences or other irregularities are likely to interfere with complete exhaustion.

LEECHES.

Leeches are commonly used when it is desired to take a small quantity of blood from any locality. They affect a more limited space and are preferable to cups if the part is at all sensitive or inaccessible. There are two varieties, the American and the foreign. The former has three stripes down the back and the latter five or six. The foreign leech is larger and more voracious, drawing four or five times its own weight of blood.

How Applied.—They should not be applied over any large vessel, but over a bony surface upon which pressure can be made in case of excessive hæmorrhage. Various devices are proposed for inducing a leech to take hold. A slight scratch just sufficient to give the taste of blood will usually overcome any hesitation; or put a leech in a wine glass of water, cover with a card and invert over place; hold it close and slip out the paper-

when the leech, being in his native element, will probably sink and fasten promptly.

Caution.—If the leeches are to be applied inside the mouth or nostrils it is well to pass threads through their tails. It will not interfere with their working and will prevent them from being swallowed. Should such an accident occur, they can be at once rendered harmless by drinking freely of salt and water. A leech should be stuck from three-quarters to one hour. If they seem sluggish they can be excited to action by gentle stroking with a dry towel. When full they will drop off. If you wish to take them off sooner, sprinkle a little salt on their heads. Never remove by force, or the teeth will be left in the wound, where they may occasion abscess. The leech bite leaves a permanent stellate scar.

How to Encourage Bleeding or Check It.—The bleeding may be encouraged by hot fomentations or poultices, or checked, if too profuse, by a compress of lint, an application of ice, or, if it resist these, by touching with nitrate of silver. A patient should never be left until all bleeding has ceased.

After use throw the leeches away, as they are hardly ever of any use again.

IRRITANTS.

Irritants are medicines which are used locally to produce counter-irritation or inflammation of the parts to which they are applied. They are divided, according to the violence of their action, into rubefacients, vesicants, suppurants and escharotics or caustics.

Rubefacients are medicines which are used to produce a powerful but temporary irritation and conges-

tion of the surface to which they are applied. They are useful in arousing the system in shock, in stimulating the circulation of a part in case of frost-bite, or to aid in bringing on reaction in the cold stage of a congestive chill, in all stages of congestion and in the formative stages of inflammation.

The principal rubefacients are mustard, capsicum, oil of turpentine, ammonia, Burgundy pitch and Canada pitch.

Vesicants are remedies which, when applied to the skin, cause sufficient inflammation to produce an effusion of serum under the cuticle, or, in other words, to raise a blister. They are also called epispastics, or blisters. They are used in inflammation of the serous membrane, in chronic joint affections, in neuritis and for the relief of various neuralgic pains.

The principal vesicants are Cantharis or Spanish fly, potato fly and stronger water of ammonia.

Suppurants are remedies which cause such powerful irritation of the surface to which they are applied as to produce a crop of pustules. They are seldom employed at present except as an application to the throat and chest in chronic laryngeal or bronchial affections, or to the surface of a joint when chronic inflammation is present.

The only medicines belonging to this order are Croton oil and antimonial ointment.

Escharotics are medicines which are applied locally to destroy the structure and vitality of the tisues. The dead tissue excites inflammation and is thrown off by the ulcerative action. Escharotics are used to destroy morbid growths and to destroy the virus of malignant

pustule, hospital gangrene, the bites of rabid animals or poisonous reptiles, the virus of chancre, etc.

The principal medicines used for these purposes are caustic potash, caustic soda, arsenious acid, bromine, corrosive sublimate, the mineral acids, silver nitrate, copper sulphate and burnt alum.

ISSUES.

Issues.—An issue is formed by placing on the skin a piece of adhesive plaster, in a hole in the center of which a fragment of caustic potash is inserted. The caustic causes an eschar, and when this has come away an issue-pea is placed in the cavity left by the eschar. This pea acts as a foreign body and keeps up suppuration. An issue requires to be dressed daily, and when it has been long opened and running it must not be be healed too suddenly.

SETONS.

Setons.—A seton is made by passing a narrow-bladed knife under a fold of skin and then carrying a few silk threads through the incision by means of a probe or long needle. The thread remaining in wound prevents it from healing and maintains a free purulent discharge.

Cautery.—The cautery consists of a piece of metal, generally iron or platinum, raised to a variable temperature by the head of a flame or fire, or by some special means, as in the galvanic or Paquelins cautery.

Uses.—It is used for the following purposes: For dividing soft tissue, as in removing portions of the

tongue and cervix uteri; for destroying vascular and fungating growths; for arresting hæmorrhage; and for the purpose of counter-irritation. The degree of heat employed varies to some extent in each of these cases. Three degrees of heat are recognized, white, red and black, and it is stated that when heated to the white degree the cautery gives but little pain.

POISONS, SYMPTOMS AND ANTIDOTES.

Poison.—Dunglison defines a poison to be "any substance which, when introduced into the animal economy, either by cutaneous absorption, respiration, or by the digestive canal, acts in a noxious manner on the vital properties or the texture of organs."

Quantity. — Quantity is an important factor, the amount of harm done being in proportion to the amount operating. A substance may be a poison and yet be taken in such minute proportions that it is no longer noxious, but, on the contrary, salutary Many of the most important remedies are poisonous, and it would be impossible to substitute the non-poisonous.

Bottles.—Have all bottles labeled; if not labeled, empty them and break the bottle. Poison should be placed in odd-shaped bottles; handling them speaks for itself, and necessitates reading the label.

Treatment.—The treatment in general consists of the use of substances which, by chemical combination, neutralize, as acids with alkalies, and *vice versa*, by solvents, which take up the poison, as olive oil with carbolic acid; by emetics, which dislodge it, as mustard and warm water, sulphate of zinc and warm water, or tickling the throat with a brush, feather or the fin-

ger; by the stomach pump, if at hand, by stimulation, until the effects pass off; by electricity, and the treatment to be given for apparent death or suspended animation. If the exact poison is unknown, it will be best to follow a general plan of treatment. We want an emetic, antidote and cathartic. For the first, tickling the throat with the finger or a feather will generally succeed. In all cases except poisoning by sulphuric acid, warm water may be freely given. This will either cause vomiting of itself or facilitate emesis, by irritating the fauces or throat. For an antidote that will meet the great majority of poisons, give a mixture of equal parts of calcined magnesia, pulverized charcoal and sesquioxide of iron; mix thoroughly. Castor oil is the best cathartic for general use in poisoning.

General Antidote.—

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Calcined Magnesia.
Pulverized Charcoal.
Sesquioxide of Iron.
Equal parts of each, and mix thoroughly.

The following are some of the more common poisons, their symptoms and the particular treatment for each:

Poison.	Symptoms.	Antidote and Treatment.
ACID, Acetic " Citric " Tartaric	Sour taste, burning of the throat and stomach, cramping, thirst, and vomited matter is streaked with blood.	Calcined magnesia 31, o1 water; vomit occasionally to relieve the stomach of its gas and liquid contents, and to supply fresh antidote. When burning ceases give mucilage and cathartics.
" Sulphuric	Symptoms same as above, but intensified. The vomited matter has the appearance of coffee grounds, and is streaked with mucus and blood.	Calcined magnesia and water, or soap and water, in the form of paste or soft soap, is the remedy. Follow with emetics, and, when burning ceases, white of eggs, glycerine or slippery elm tea.
" Muriatic " Nitric " Oxalic	These are powerful corrosive poisons, and must be antidoted promptly. The latter is often taken by mistake for epsom salts.	Give the carbonates of lime and magnesia. The stomach pump should be used, but cannot always, because the membranes and tissues of the throat are already destroyed, and the instrument only adds to the injury.
" Prussic Oil of Bitter Almonds Laurel Water	In any appreciable dose this is immediately fatal. In small quantities effects are dizziness, headache, paralysis of arms and legs, and foaming at the mouth.	Stimulants; dash cold water on the head, rub and strike the body all over.

Poison.	Symptoms.	Antidote nnd Treatment.
ACID, Carbolic	Is also corrosive.	Give olice or castor oil, any fats, or glycerine; and calcined magnesia is a good antidote.
ALKALIES Ammonia Aqua Ammonia Murate of Ammonia Lime Potash Nitrate of Potash Saltpetre Carb. Potash	Severe burning in the mouth and stomach, and sometimes vomiting of bloody matter	Give frequently a tablespoonful of vinegar or lemon juice. Follow with cathartic of castor oil.
ALCOHOL	Symptoms of intoxication may continue for some time before insensibility. When taken in small quantities there is mere excitement; in large, much excitement, confusion of intellect, followed by somnolence, even coma and apoplexy; may be mistaken for epilepsy or apoplexy.	Evacuate stomach by emetics, warm water and salt the best, repeated at short intervals. If the head is hot, dash water upon it. Keep up motion and rubbing and slapping to increase the circulation.

Poison.	Symptoms,	Antidote and Treatment.
ANTIMONY Tartar Emetic Muriate of Antimony Oxide of Antimony	Nausea, severe vomiting, hiccough, burning heat at epigastrum, colic and purging, small rapid pulse, cold skin, syncope, difficult respiration, vertigo, great prostration.	Produce vomiting by tickling the fauces and giving large draughts of warm water. Astringent infusions, as galls, oak bark, act as antidotes; strong tea or coffee; only warm liquids; stimulants, albumen, mucilage. Use the stomach pump if necessary.
ARSENIC White Arsenic Arsenic Acid Yellow Arsenic Emerald Green Fowler's Solution Fly Poison Paris Green	Metallic, austere taste; great flow of saliva; nausea and vomiting; fainting; great thirst; sense of heat in stomach; much griping; tenesmus and purging; stool dark and offensive; urine scanty, high colored; pulse small, frequent; labored respiration; cold sweats; prostration; delirium; convulsions.	Milk, gruel, decoctions of starch, oil and lime water; tickle the fauces to induce vomiting. The sulphate of zinc and water is a good antidote. It may require three or four repetitions to dislodge the sticky paste from the walls of the stomach. Oil and mucilaginous drink should be given to protect the stomach.
BELLADONNA and Atropia Hyoscyamus Duboisa	Dryness and redness of the mucous membrane of the throat, mouth, nose, larynx, tongue; pupil dilated; impaired vision; thirst; flushed face; hurried breathing, delerious excitement; convulsions; coma.	Give an emetic of sulphate of zinc and warm water, and follow with brandy and laudanum, or apomorphia, as emetic, with a cathartic.

Poison.	Symptoms.	Antidote and Treatment.
CANTHARIDES	This is ignorantly given with criminal intent. Burning in the throat, thirst, vomiting and purging, sharp pain in the bladder, with desire but inability to pass urine; if any escapes it pains and scalds; prostration.	Give emetics, with warm water. Follow with oil and stimulants, if necessary.
CHLOROFORM AND ETHER	Sudden pallor of face, humidity and gasping of breath, pulse feeble and irregular; great muscular relaxation; death occurs very suddenly in the form of asphyxia; relaxation of sphincters.	Artificial respiration; lower head; elevate the legs; inhalation of ammonia; hypodermic injections of brandy or digitalis; surface of chest to be smartly slapped with fringe of towel dipped in ice water; ice in rectum; electricity; nitrite of amyl.
COPPER Sulphate of Copper (Blue Vitrol) Subacetate of Copper (Verdigras)	This poison is found in acid foods or fruits cooked or kept in copper vessels. It is copper that gives the green color to pickles. The symptoms are coppery taste in mouth, pain in the head and stomach, griping, vomiting, purging, and sometimes convulsions.	Give emetic of warm water or mustard and warm water. Do not give vinegar or acids. After emesis, give milk or white of egg and oil.

Poison.	Symptoms.	Antidote and Treatment.
GELSEMIUM	Complete relaxation; inability to raise the foot, hand or eyelids; speech difficult and indistinct; countenance pale.	Nitrate of amyl, a few drops on a handkerchief and the vapor inhaled; continue to use while face is pale. Place him on back and have him remain so. The danger is in sitting up or standing up. Symptoms will generally wear away in from six to twelve hours and leave no bad effects.
HEMLOCK Water-Hemlock Poison-Parsley	The leaves of hemlock have been taken by mistake for parsley, and the root of water-hemlock for parsnips. Symptoms, dryness of throat, thirst, dizziness, nausea, numb feelings, paralysis and convulsions.	Give emetic of sulphate of zinc and water, or salt and water; stimulants. Keep up motion and rub the extremities.
IODINE	Cramps, vomiting, purging, thirst, trembling and fainting, fever, diarrhœa, nausea, palpitation and great loss of flesh.	Starch. Give in water and follow with emetic. Repeat if necessary.

Poison.	Symptoms.	Antidote and Treatment.
LEAD, its salts	Obstinate constipation, violent colic, retraction of the abdomen, vomiting, small, hard pulse, tremors, labored breathing, gums with a blue tinge, paralysis of extremities.	Saline cathartics, almond or olive oils, alum, albumen, opium to relieve pain and relax spasms; iodide of potassium in the chronic form.
MERCURY Corr. Sublimate Calomel Vermilion	Metallic taste, vomiting and purging of bloody matter, intense thirst, difficulty in speaking, breathing and urinating, convulsions, coma and death.	Give promptly the white of eggs mixed in water or milk; use the stomach pump or produce emesis by tickling the throat. Again fill the stomach with the egg and water or milk, or even flour and water. Resulting inflammation may be treated as gastritis.
OPIUM Morphine Laudanum Paregoric Godfrey's Cordial Soothing Syrup	Dark, suffused countenance, drowsiness, stupor, perfect insensibility or profound coma, pallid countenance, slow respiration, deep and stertorous breathing, cold sweats, slow full pulse, cold and livid skin, suspension of all the secretions except that of the skin, pupils minutely contracted, insensible to stimulation; at	Give emetic, sulphate of zinc and water. If emetics will not act, persevere, and by irritating the throat you will be successful. Repeat until stomach is cleansed of its contents. Then give strong coffee or solution of tannin. The patient must be kept in constant motion. At the same time he must be frequently aroused by

Poison.	Symptoms.	Antidote and Treatment.
OPIUM	length pulse frequent, feeble and thread-like; sometimes convulsions, particularly in children.	smart blows with the palm of the hand or by flagellation or flapping the body with the corner of a wet towel. When all else fails artificial respiration should be kept up for a long time.
PHOSPHORUS Matches, etc.	Hot oniony taste in mouth, acrid burning sense in throat and stomach, nausea, vomiting, pulse small and frequent, vomited matter of a dark color, emitting white fumes.	Mixtures of hydrated magnesia and cold water, in repeated draughts; promote vomiting by tickling the fauces with a feather. Do not use oil, as it tends to dissolve the phosphorus. Emetic, mustard, flour and water.
STRYCHNINE Nux Vomica St. Ignatius Bean Rat Poison	Restlessness, twitching of the muscles, convulsions with strong contractions, spine bent backwards and head thrown back, and asphyxia.	Emetic of sulphate of zinc, gr. 20 to 30. After this operates, administer strong solution of tannin or draughts of strong coffee. Control the convulsions by inhalations of chloroform, a teaspoonful poured upon the napkin and placed near the nostrils. Between the paroxysms give chloral dissolved in water. The patient should be allowed to go to sleep, if so inclined, or, at all events, kept perfectly quiet, for any shock to surface brings convulsions.

Poison	Symptoms.	Antidote and Treatment.
TOBACCO	Faintness, giddiness, vomiting, great prostration, delerium, and convulsions sometimes.	Stimulants, by the mouth or rectum; strong coffee and the spirit vapor bath.
ZINC Sulphate Zinc (White Vitrol) Chloride of Zinc (Burnett Disinfectant)	Produces pain and violent vomiting, in large doses, but seldom death, as it is an emetic. The chloride is corrosive, and is accompanied with vomiting, pain and burning sensation in throat and stomach.	Warm water to assist emesis; the white of eggs in water or milk. The inflammation following may be severe and perhaps fatal.
VENOMOUS SNAKE BITES	Sharp pain in wound, later on extending over limb and body; first pale, then red and swollen; faintings; convulsions; small, frequent, irregular pulse; difficult breathing; cold sweats.	Tight ligature above point of bite; leave wound to bleed and augment by sucking; cauterize by means of caustics; free alcohol stimulation, warm drink; dress wound with equal parts of olive oil and ammonia.
POISONOUS MUSHROOMS	Nausea, heat and pain in stomach and bowels, vomiting and purging, thirst, convulsions and faintings, pulse small and frequent, stupor, dilated pupils, cold sweats.	Brisk emetic; then epsom salts; large and stimulating enemata; ether and alcoholic stimulants.

ENEMATAS.

Enematas, Character.—An enemata or clyster is a liquid injected by means of a suitable instrument into the rectum or colon, and may be laxative, demulcent, nutritive, stimulant or vermifuge in character. Their diluent is always water, which should be warm or tepid, and with which are incorporated such medicaments as may be desired. They may consist of water alone, as a wash, for the purpose of cleansing the lower bowels.

Instruments.—Various instruments are used for the administration of such, viz.:

a. A simple elastic bottle, with ivory or gum elastic pipe, which has succeeded the old bag and pipe.

b. An India rubber bulb, with flexible tube at either end, and double action.

c. An ordinary piston syringe, worked by the hand, which is either simple or provided with a double action, so as to supply a continuous stream.

d. The hydraulic enema, which consists of a piece of India rubber tubing about six feet long, furnished with an ordinary rectum pipe at one end and a metallic cone or a screw nozzle at the other. The tube being filled with the injection, has one end placed in the containing reservoir, or is connected by the screw, while the pipe at the other end is introduced into the bowel. The vessel supplying the injection being placed on an elevation, the liquor gravitates into the bowel, filling the large intestine.

Care.—In all cases care should be taken to prevent the injection of air into the bowel and also to ascertain that the nozzle of the injecting pipe is free in the

rectum, not thrust against the sacrum or into a hard fæcal mass.

Large Injections.—When it is desirable to inject a large quantity, the patient should lie first on the left side, then on the back, and lastly on the right side, to promote the filling of the whole intestine.

Frequent Injections.—The frequent use of very large injections is undesirable, lest undue distention result. The frequent use of injections washes away the mucus designed to lubricate the bowel.

Care of Syringe.—After using a syringe, clean it by letting plenty of warm water run through it; wipe it on the outside and hang it up by the extreme end to drain. Never put it away while damp. A hard rubber syringe shrinks in drying, but this can be remedied by soaking in hot water.

Enemata	for infants,		℥ ½—1
"	" child,	2 to 5 years,	℥ 2—4
"	" "	5 " 15 "	℥ 6—1 pint
"	" adult,		Oi—2

The following are standard formulas for enematas, and which it is desirable you should become thoroughly acquainted with:

Enema Aloes (Enema of Aloes).—

℞

Aloes, gr. 40
Carbonate of Potassium, gr. 15
Mucilage of Starch, f℥ 10
Mix and rub together.

This is used in case of ascarides of rectum.

Enema Asafœtidæ (Enema of Asafetida).—

℞

Asafœtidæ, gr. 30
Distilled Water, ℥ 4

Rub the asafetida in a mortar with the water, gradually, so as to form an emulsion. This is carminative and anti spasmodic, as well as laxative.

Enema Colcynthides (Enema of Colcynth).—

℞

Ex. Colcynth, ʒ ½
Soft Soap, ʒ 1
Water, O1
An efficient cathartic.

Enema Tabaci (Enema of Tobacco).—

℞

Tobacco, gr. 20
Warm Water, ℥ 8

It is employed in cases of strangulated hernia, but occasionally acts as a poison, when given in this way.

Enema Opii (Enema of Opium).—

℞

Tincture Opium, ʒ ½
Mucilage of Starch, f℥ 2

Anodyne, exhibited in cases of severe diarrhœa and dysentery.

Enema Terebinthinæ (Enema of Turpentine).—

℞

Oil of Turpentine, f℥ 1
Mucilage of Starch, fʒ 15

Administered in cases of ascarides.

Enema Nutrient (Enema Nutritives).—

℞

Infus Carnis (beef tea), ℥ 4

Acidum Hydrochloricum (Muriatic acid), ♏ 10

Glycerite Pepsini (Sheffer), ʒ 2

Nutritive enemas should contain material for artificial digestion, as the rectum is not an organ of digestion, and to secure rapid osmosis (the passage of fluid through a porous solid), should have an acid reaction. To the above formula, if rectum is irritable, add 10 to 20 drops of tincture of opium.

ARTIFICIAL RESPIRATION.

Variety of Methods.—Three methods of artificial respiration are accepted as being particularly efficient, viz.: Sylvester's, Howard's and Hall's. The first (Sylvester's) is generally regarded as being the best. The methods of Sylvester and Howard may be performed by one person, which is a very important consideration.

Previous Preparation.—Before artificial respiration is begun, the patient should be stripped to the waist and the clothing around the latter part should be loosened so that the necessary manipulations of the chest may not be interfered with. Next the tip of the tongue must be drawn forward and out of the mouth, as otherwise it will fall back into the throat and impede breathing. This is an important matter, for if it is not done successfully all that would otherwise be gained by artificial respiration may not be accomplished. Let a bystander grasp the tongue with a dry handkerchief, to prevent it slipping from the fingers,

or he may cover his fingers with sand for the same purpose. If alone, draw the tongue well out and tie it against the lower teeth. To do this, lay the center of a dry strip of cloth on the tongue and cross it under the chin; carry the ends around the neck and tie them at the sides of the neck.

Care of Tongue.—Do not attempt to tie anything around the tongue, as it will probably slip off. By far the best way of securing the tongue is to run through it about half an inch from the tip a large pin or needle for about half its length. The pin will rest against the upper and lower lips and prevent tongue falling back.

Sylvester's Method. — The water and mucus are supposed to have been removed from the mouth and the tongue secured by the means above described. The patient is to be placed on his back, with a roll made of a coat or shawl under the shoulders. The nurse should kneel at the head and grasp the elbows of the patient and draw them upward until the hands are carried above the head, and kept in this position until "one, two, three" can be slowly counted. (Fig. 1).

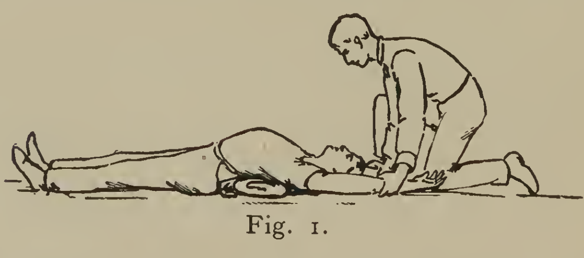


Fig. 1.

This movement elevates the ribs, expands the chest and creates a vacuum in the lungs into which the air

rushes, or, in other words, the movement produces inspiration. The elbows are then slowly carried downwards, placed by the sides and pressed inward against the chest, thereby diminishing the size of the latter and producing expiration. (Fig. 2). These movements should be repeated about fifteen times during each minute for at least two hours, provided no signs of animation present themselves.

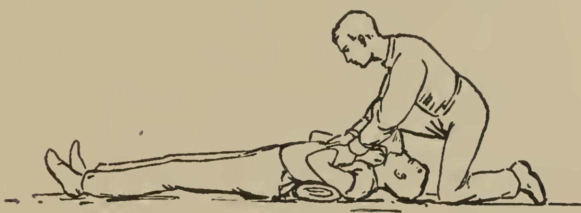


Fig. 2.

Howard's Method.—Howard's method is divided into two parts:

Part First consists in removing the water, etc., from the respiratory tract and stomach, and is as follows: The patient should be placed face downwards, with a pillow or roll of clothing undet the pit of the stomach, the head resting on the forearm, which keeps the mouth from the ground and renders traction on the tongue unnecessary. The attendant, standing over the drowned person, should then place his left hand on the lower and back part of the left side of the chest, while the right hand is laid on the spinal column about on a line or a little above the left hand. Firm pressure is then made by the operator, throwing the weight of his body forward on his hands. This is to be continued while "one, two, three" are counted,

slowly, and ended with a push which helps to raise the operator to an upright position and forcibly expel the fluid. These movements should be repeated two or three times if fluid continues to flow from the mouth. (Fig. 3).

Fig. 3.

Part Second: Artificial Respiration.—The patient should now be turned on his back, face directly upward, with the roll placed under the shoulders; it should be made thick enough to allow the head and neck to be fully thrown back. The hands of the patient should be carried above his head and tied with a handkerchief, suspenders, etc. The nurse should then kneel astride the patient's hips and place the palms of his open hands upon the lower part of the patient's chest, with the thumbs at the lower border of the breast bone, the fingers being applied to the spaces between the ribs, the little finger being laid along the lower border of the ribs in front. The hands are then pressed slowly and firmly upward and inward toward the diaphragm, with the body of the nurse thrown forward until his face is nearly in contact with that of the patient. A sharp push is then made upon the chest, which helps to bring the nurse to an upright position. A rest of

two or three seconds should then follow, and the movement repeated. These proceedures should continue for about two hours before being abandoned, unless the patient is sooner restored. (Fig. 4).

Fig. 4.

Hall's Method. — The drowned person should be placed face downward, the head resting on his forearm, with a roll or pillow placed under the chest. He should then be turned on his side, an assistant sup-

Fig. 5.

porting the head and keeping the mouth open. After an interval of two or three seconds the patient should again be placed face downward and allowed to remain in this position the same length of time. The operation should be repeated fifteen or sixteen times each minute, and continued (unless the patient recovers) for at least two hours. (Figs. 5 and 6).

If, after using one of the above methods, evidence of recovery appears, such as an occasional gasp or muscular movement, the efforts to produce artificial respira-

tion must not be discontinued, but kept up until respiration is fully established.

Restoration of Warmth and Circulation.—As soon as respiration is fairly established, put the patient into a warm bed, if possible. Place hot water bottles or warm bricks along each side of the body, on the pit

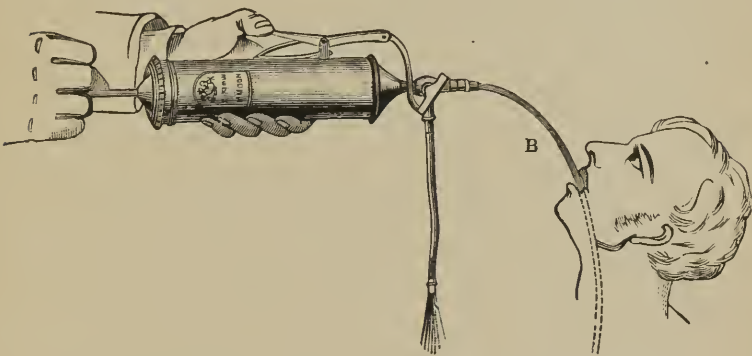
Fig. 6.

of the stomach, between the thighs, in the arm pits and at the soles of the feet. Continue to use friction and all kinds of warmth until life is fairly restored. As soon as the patient can swallow, give warm drink—hot tea, coffee, or whiskey and water in half ounce doses. if there is a persistent difficulty in breathing, a large mustard plaster is to be applied to the chest.

STOMACH PUMP.

How Used.—The stomach pump should be used as follows: Bend the extremity of the long tube rather abruptly at its point and oil it; pass it to the back of the throat, and when the tube touches the back of the pharynx bend the patient's head a little forwards; slight pressure will then make the tube pass on to the back of the larynx, when it will be arrested; but gentle pressure will overcome the difficulty. When the tube has reached the stomach inject some water.

In order to do this, fill the pump with water from a basin by steadily drawing out the piston, the lever connected with the stop-cock being not pressed down. The pump being filled with water, press down the lever



with the thumb of the left hand and gently press in the piston with the right, thus propelling the water into the stomach. When enough has been injected, reverse the action. If the tube becomes blocked, again reverse, and so eject the fragment blocking the eye of the tube.

Gags.—If the patient is unconscious or unruly, the mouth must be opened with a screw-gag and kept open with a wooden gag supplied for the purpose with the stomach pump.

Simpler Method.—A far simpler and less expensive form of stomach pump has been introduced lately. It consists of a long, flexible India rubber tube, which is passed to the back of the mouth, and then its passage down the æsophagus is effected by twisting it round and round in the hand until it reaches the stomach. One end of the tube is then fixed to the apparatus,

which consists of a Davidson syringe without the valve, and the other end is placed in a jug of water. Then the tube is pinched up by the finger and thumb at a point between the ball and the mouth, the ball being at the same time compressed by the other hand and the air in it expelled. The ball then becomes filled with water, and on raising the jug above the patient's head and discontinuing the pinching of the tube the water flows in a continuous stream into the stomach. When enough has been introduced, the tube must again be pinched between the ball and the mouth, the end of the tube taken out of the jug and placed in a basin below the level of the stomach, when, upon discontinuing the pinching of the tube, the fluid will flow in a continuous stream from the stomach into the basin placed to receive it. Should the stomach tube become choked, it can be freed by pinching the tube between the ball and the jug and compressing the ball with the other hand, when the fluid contained in it will be pressed out and the tube freed.

ELECTRICITY.

Nurses are sometimes required to carry out a course of treatment in which one of the various forms of electric battery is used. Without attempting to give anything like a complete description of these, it may be useful to call attention to one or two points.

Different Methods.—At the present time electricity is used for medical treatment in two or three forms which are known as:

1. Faradism (induced or interrupted electricity).
2. Galvanism (Voltaism or continuous electricity).

Faradism.—In faradism the current is perpetually interrupted and renewed at very short intervals by a self-acting mechanical appliance. This form of electricity may be produced by a chemical battery, in connection with what is known as an induction coil, or else by one of the electro-magnetic machines in common use, in which by turning a handle a small double coil is made to revolve close to the ends or poles of a large magnet.

Galvanism.—For the continuous current, or galvanism, a chemical battery of one or more divisions or cells is required.

Application of Currents.—Electricity may be used either generally or specially, and it should be a rule always to begin with a weak current and gradually increase the strength. Strong currents are only used in exceptional cases.

General and Local Effects.—When it is wished to affect the system generally the patient may hold the metallic rheophores, or current carriers, one in each hand, or, while he holds one, the nurse may apply the other to various parts of the body. In order to influence any particular muscle or group or muscles, the sponges and the part affected should be moistened with a solution of salt and water

Care of Metallic Points and Connections.—All metallic points and connections must be kept bright and clean, as batteries are frequently rendered inactive by want of attention to this detail.

Ohm.—The unit of measure of resistance is called an *Ohm.*

Volt.—The unit of measure of electro-motive force is called a *Volt.*

Ampere.—The unit of measure of current strength is called an *Ampere.*

BATTERY FLUIDS.

Liquid Electropœicus.—

℞

Bichromate of potassium or sodium, 6 troy oz.
Sulphuric acid (commercial), 5 fluid oz.
Water (cold), 3 pints.

Pour the sulphuric acid upon the powdered bichromate and stir occasionally for one hour; add the water slowly. For the carbon and zinc battery for ordinary use.

℞

Chloride of ammonium, 6 av. oz.
Water, 20 fl. oz.
Dissolve.
For the Leclanche battery.

MISCELLANEOUS FORMULÆ.

Antiseptic Dressings.

Bichloride Gauze.—Impregnate absorbent gauze with a solution of bichloride of mercury of the strength of 1 in 1,000. Wring it out, roll it up, and put it away for use, wrapped in paraffine paper. It may be rendered less irritating by using a solution of bichloride containing 10 per cent. of glycerine.

Note.—All solutions of bichloride used for antiseptic purposes ought to be faintly tinted with eosine or fuchsine, so as to permit the solution, as well as the fabrics impregnated with it, to be distinguished by their pinkish tint from others.

Boric Acid Gauze. — Make a solution of 1 part boric acid in 10 parts boiling water; saturate absorbent gauze with the solution, withdraw it, wring it out

gently, only enough to keep the liquid dripping from it, and dry it by hanging it up in a horizontal position, to prevent the solution from draining more to one side than the other.

NOTE.—The boric acid, which crystallizes on cooling, is apt to fall off the fabric when dry. This may be somewhat prevented by adding to the solution a little tincture of benzoine or a small quantity of a solution of shellac in borax.

Carbolized Gauze (after Lister).—Melt together 5 parts resin, 7 parts paraffin, and then add 1 part carbolic acid. Impregnate loosely-woven muslin with the mixture, in a properly arranged steam chamber, where the escape of carbolic acid vapors can be prevented. Remove the impregnated gauze after a few hours; wrap it in paraffin paper and keep it in air-tight tin boxes.

Carbolized Gauze (after Bruns).—Dissolve 25 lbs. resin in 13 gallons of alcohol; then add 5 lbs castor oil, 7 lbs carbolic acid and 1 lb. tincture benzoin. Soak in this solution folded pieces of gauze muslin of suitable size (about 7 to 12 yards in length), and after they have been thoroughly saturated pass them through a cloth ringer to press out the excess of liquid Let the pieces be spread out and stretched by two persons holding the ends, and let them be swung about for a few minutes until the remaining alcohol has nearly evaporated and the fabric feels only slightly damp. Then roll or fold tightly and keep in air-tight boxes.

Iodoform Gauze.—Dissolve 4 parts of iodoform in 16 parts (by weight) of ether; then add 16 parts of alcohol, 2 parts tincture benzoin and 2 parts glycerine. When preparing iodoform gauze at the bedside, pour

such amount of the above solution (which is inflamable) as will contain the amount of iodoform to be incorporated with the gauze into a wide beaker or other suitable vessel and immerse the requisite quantity of absorbent gauze in it, so that it may completely soak up the liquid and will be uniformly impregnated with it. Then remove it, dry it as far as necessary by opening it out and swinging it about, and then apply it or wrap it in paraffin paper, and keep in air tight boxes. The gauze should not be exposed to sunlight.

In some institutions iodoform gauze is prepared by placing bichloride gauze in a mixture of equal volumes of alcohol and glycerine, wringing it out dry and then rubbing any desired quantity of iodoform into it.

NOTE.—The odor of iodoform may be removed from the hands or from any utensils with which it has come in contact by washing them with an aqueous solution of tannic acid.

Napthalin Gauze.—Place absorbent gauze into a saturated solution of napthalin in alcohol; wring it out, dry it and put it away in tightly-closed boxes.

Styptic Cotton.—Purified cotton, solution of chloride of iron, glycerine, water, each a sufficient quantity. Mix the liquids in the proportion of 5 parts of the iron solution, 1 part glycerine and 4 parts water in such quantity that the purified cotton shall be completely immersed in the liquid when gently pressed; allow the cotton to remain in the liquid one hour; then remove it, press it until it has been brought to twice its original weight, spread it out in thin layers in a warm place protected from dust and light, and when it is sufficiently dry transfer it to air-tight receptacles.

Boracic Lint.—Prepare by steeping lint in a boiling saturated solution and drying it until it contains nearly one-half its weight of the acid.

Corrosive Sublimate Cotton.—Absorbent cotton soaked in solution of bichloride of mercury, 1 in 1000, and faintly tinted with eosine and dried in loose layers.

Antiseptic Silk.—Boil the silk for 20 minutes in water; then remove it, wring it out or press it and place it in a solution of mercury, strength 1 in 5,000.

Antiseptic and Bleached Sponges.—Deprive the sponges of sand and dirt by beating and picking, and then wash them thoroughly in water; wring them out and transfer them to a 1 per cent. aqueous solution of permanganate of potassium, in which they should be well worked about. Remove them after about one hour, wash them thoroughly with water and squeeze out the latter as much as possible; then put them into a solution of hyposulphate of sodium, containing ½ pound in 1 gallon, to which some hydrochloric acid (1 fluid ounce for every gallon of the solution) has been added just previous to the immersion of the sponges; leave them in this liquid for fifteen minutes, occasionally squeezing them and working them about. Finally, take them out, wash them thoroughly, and, having wrung them out, keep them in a 1 in 40 solution of carbolic acid.

NOTE.—Some sponges contain a large reddish core, which is not always bleached by one treatment. By repeating the operation the desired result is usually accomplished.

Antiseptic Sublimate Catgut.—Commercial catgut is wound upon glass spools and placed in a 5 per cent.

alcoholic solution of corrosive sublimate. This solution is changed repeatedly until it remains clear. (Bergman). Another method is to place the catgut in a 1 per cent. solution of sublimate for twelve hours and then to preserve it in a ½ per cent. sublimate solution containing 10 per cent. of glycerine. (Schede and Kümmell).

Antiseptic Carbolized Catgut.—Commercial catgut is wound upon spools and placed for 48 hours in a 5 per cent. solution of carbolic acid. It is then transferred to a vessel containing a fresh solution of the same strength, when the gut is removed from the spool and then again firmly wound upon it and preserved in a 5 per cent. solution of carbolic acid in alcohol. (Block).

Antiseptic Carbolized Silk.—The silk is boiled in a 5 per cent. carbolic solution for a period varying from ten minutes to an hour and a half, according to the strength of the silk, the fluid being renewed every half hour. The silk is preserved in a 2 per cent. watery solution of carbolic acid. (Czerny).

Antiseptic Sublimate Silk.—The silk is boiled for two hours in a 1 per cent. sublimate solution, and preserved in a 1 to 1,000 solution. (Schede and Kümmell).

ANTISEPTIC SOLUTIONS.

It is often required to prepare for immediate use a solution of a certain strength, designated either by percentage or by such terms as "1 in 1,000," "1 in 5,000," etc. When great accuracy is required, or when the solvent is one which is much lighter or heavier than water, such solutions must be made by weight.

When the solution is aqueous, however, and a fair approximation to the exact strength designated is sufficient for all practical purposes, the solution may be made in a more expeditious manner by making it up to a definite measure. The following table will give at a glance the quantities of any solid in grains, or of any liquid in minims, required to prepare a pint of a solution approximately of the desired strength:

Required to contain of a certain drug.				Take of the drug.	
		1 "	10000	0.7 (1)	gr. or min.
		1 "	5000	1.4 (1½)	"
		1 "	4000	1.8 (2)	"
		1 "	3000	2.4 (2½)	"
		1 "	2500	2.9 (3)	"
		1 "	2000	3.6 (3½)	"
		1 "	1500	4.8 (5)	"
1-10	per cent. or	1 "	1000	7.2 (7)	"
1-5	"	1 "	500	14.5 (14½)	"
¼	"	1 "	400	18	"
⅓	"	1 "	300	24	"
½	"	1 "	200	36	"
1	"	1 "	100	72	"
2	"	1 "	50	144	"
2½	"	1 "	40	180	"
3	"	1 "	33	220	"
3⅓	"	1 "	30	240	"
4	"	1 "	25	288	"
5	"	1 "	20	365	"
10	"	1 "	10	720	"
20	"	1 "	5	1440	"

Supposing a 1 per cent. solution of carbolic acid is to be made, then take 72 minims of crystallized car-

bolic acid, just sufficiently heated to render it liquid (using a minim graduate which had been previously warmed), and dissolve it in enough water to make 1 pint. This will be approximately correct. For absolute correctness the carbolic acid must be weighed—72 grains.

If a 1 in 1000 solution of bichloride of mercury is to be made, dissolve 7.2 grains of the salts in enough water to make 1 pint.

Under ordinary circumstances it is not necessary to use the small fractions, but the quantity may be rounded off, as shown by the figures in parenthesis.

NOTE.—One pint of water measures 7,680 minims, but weighs only 7,291 grains. It is upon the weight of one pint of water that the given proportions are based.

Hydrargyri Chloridum Corrosivum (Corrosive Chloride of Mercury).—For convenience, cleanliness, efficiency and economy solution of corrosive sublimate excels all other antiseptics and disinfectants.

Acidum Carbolicum (Carbolic Acid).—Carbolic acid is a powerful disinfectant and antiseptic. It arrests all kinds of putrefactive change and quickly destroys animal and vegetable germs, being also an excellent deodorant. It is used extensively for disinfecting stools, etc.

Liq Boro-Salicylicus (Thiersch's Sol.)—

℞

Salicylic acid,	part	1
Boric acid,	'	6
Water,	"	500

Dissolve and filter.

Is a good antiseptic solution. It does not produce the cathartic influence upon the tissues so characteristic of the strong carbolic acid and corrosive sublimate solutions, and therefore the tissues to which it is applied retain their normal appearance.

Potassii Permanganas (Permanganate of Potassium) (Condy's Fluid).—

℞

Permanganate of Potassium, gr. 4
Water, ℥ i.

This antiseptic is of great value in many diseases attended with decomposing or offensive discharges, as ulcerating cancer, gangrene, gonorrhœa, etc.

Volkman's Antiseptic (Liquid).—

℞

Thymol,	1	part
Alcohol,	10	"
Glycerine,	20	"
Water,	100	"

Dissolve the thymol and the alcohol, add the glycerine, then the water.

Acidum Boricum.—Boric acid is not a chemically vigorous acid at ordinary temperature, but is, notwithstanding, in strong solution, an efficient antiseptic. It is used as a dressing for many external injuries and as an injection into bladders in cystitis, etc.

Glyceritum Acidi Carbolici.—

℞

Carbolic acid,	5	parts
Glycerine,	25	"

It is used principally for oiling instruments before introducing them into the urethra.

Ferri Sulphas (Green Vitrol).—

℞

Copperas, 4 lbs.
Water, 2½ gallons.
Mix.

For disinfecting closets and foul drains.

Liq. Sodæ Chloratæ (Labaraque Solution).—An aqueous solution of chlorinated soda, made by the action of chloride of lime upon sodium carbonate. It is a pale. greenish liquid of faint chlorine odor. Is a good application to bites of serpents and insects, to prevent infection by the syphilitic poison, and as a wash for the hands after contact with infectious material.

NOTE.—This solution destroys the color of fabrics.

Zinci Sulphas (White Vitriol).—

℞

Sulphate of Zinc, ℥ 2
Carbolic Acid, ℥ 1
Hot Water, Ci
Mix well together.

For washing clothing in contagious diseases. Soak articles 12 hours; then wash; use only for same case; burn clothes afterwards.

Heat.—Heat is highly recommended as a means of destroying animal and vegetable germs, and infectious matter. It is especially valuable for the disinfection of clothing, bedding and the like, when it can be confined, but is not so readily applicable for cleansing the air. To be effective, a heat of at least 140° Fahr. is required; 160° or 180° is even more certain, and may be applied without risk to the surface.

ANTISEPTIC GARGLES.

1. Solution of permanganate of potassium, ʒ2 to ℥8 water.
2. Solution of chlorinated soda, ʒ1 to ℥8 water.
3. Glycerite of carbolic acid, ℥½ to ℥8 water.
4. Sulphurous acid, ʒ1 to ʒ3 water.

PERFUMES.

Danger in the Use of Perfumes.—The use of perfumes, now carried to such an extent, renders them liable to considerable adulteration. Consequently there is a danger in using them, without knowing exactly the qualities they are composed of. The following perfumes, etc., any of which is a welcome addition in the sick room, will be found harmless and efficacious:

Spiritus Odoratus (Cologne Water).—

℞

Oil of bergamont,	℥2
" lemon,	℥1
" rosemary,	℥1
" lavender flowers,	℥½
" orange flowers,	℥½
Acetic ether,	ʒ2
Water,	℥20
Alcohol,	O6

Dissolve the oils and the ether in the alcohol and add the water; set the mixture aside in a well closed bottle for eight days; then filter through paper in a well covered funnel. The above is used as a cooling lotion for heads of feverish patients, back wash or perfume for handkerchiefs, etc. Its agreeable odor is always very much appreciated and gratifying.

Spiritus Lavandulæ (Lavender Water).—

℞

Oil ot lavender,	ʒ½
" bergamont,	ʒ½
" lemon,	ʒ½
" neroli,	ʒ½
Extract Jasmin fluid,	℥4
Musk,	℥1
Rose water,	O1
Deodorized alcohol,	O7
Carbonate of magnesia,	qs

Mix, and, if it should appear in any way cloudy, filter the product previously mixed with the carbonate magnesia, and color slightly by the cautious addition of tincture of sage or tincture of common grass.

Spiritus Myrciæ (Bay Rum).—

℞

Oil of myrcia,	℥2
" orange peel.	ʒ1
" pimenta,	ʒ1
Alcohol,	O8
Water,	O6

The use of bay rum is constantly increasing, and its applications are very numerous indeed. Among the more common services which it renders is that of a dressing for the hair, application after shaving, addition to the bath, etc.

Tincture for the Teeth (Ruspini's).—

℞

Florentine orris,	℥8
Cloves,	℥1
Alcohol.	O2
Ambergis,	℈1

An empirical and pleasant preparation for the teeth.

Ceratum Cosmeticum (Pommade en Créme).—

℞

Oil of almond,	℥4
White wax,	ʒ3
Spermaceti,	ʒ3
Rose water,	℥3
Tinct. balsam of Mecca,	ʒ2

Mix.

Emmolient and cooling. An agreeable application to chapped lips and hands.

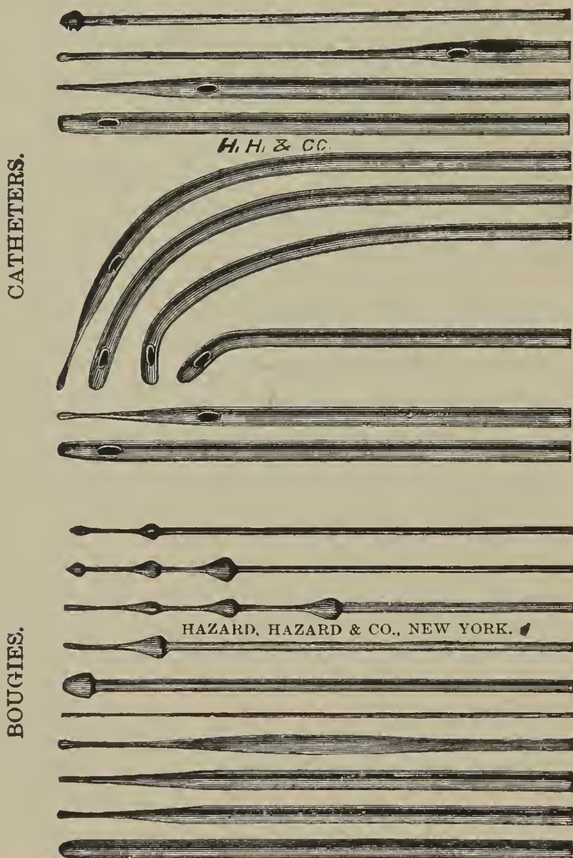
CATHETERS AND CATHETERISM.

Catheters are hollow instruments for emptying the urinary bladder. They are constructed of silver or flexible material, either rubber, woven silk or linen. The flexible catheters of woven silk have two principal forms:

English.—The English, so-called "gum elastic" are of the same thickness throughout, have an eye near the beak and are mounted on a wire stylet, highly flexible when warm, they stiffen when cold, and thus can be given any required curve, which they will retain until again heated.

French.—The French flexible catheters taper for the last three inches to the beak, becoming very pliant and fine near the point. Tne beak itself is rendered blunt by ending in a small swelling or "olive;" hence the name "olivary" applied to these catheters. A well shaped one should be very smooth, have eyes with nicely rounded edges, and when the point or beak meets an obstruction the flexible neck behind it should yield at once in a sharp bend, not in a gradual curve.

Vulcanized India Rubber and Celluloid.—Catheters are also made of vulcanized India rubber and cel-



luloid. The former are valuable from their extreme suppleness; the latter from their smoothness and unsusceptibility to roughening by phosphatic incrustation.

Silver Catheters.—The silver instruments are about eleven inches long, of equal thickness throughout, closed and rounded at one end (the beak) to slide along the urethra, and furnished with two rings near the open end (the mouth), to which tapes may be attached when the catheter has to be retained by the patient. As the rings near the mouth are fixed on each side of the stem, they indicate the direction of the beak, which is in a plane parallel to that of the openings. Each instrument has a wire stylet.

English and French Scale of Sizes.—The catheters range in size from No. ¼, English, to No. 12. The first has a diameter of 0.06 inches and the latter 0.25 inches. The English scale does not advance in equal steps, and also varies with different makers. The French scale ranges from 1 to 40, and each numeral denotes the circumference of the catheter in millimetres.

Catheterism.—The introduction of a sound, staff or catheter into the bladder is generally spoken of as catheterism. The use of the staff or sound is sometimes denominated "sounding." The manœuvre in either case is the same, and to perform the operation is less simple than would at first appear. No amount of instruction, no volumes of direction, can teach the nurse how to pass the sound. He must receive practical instruction on this point from one who is qualified to give it. Some advice and suggestions may, however, be given.

Always make the patient lay down on his back, with his head on a pillow, his legs slightly separated, his body relaxed, his fears quieted and himself as comfortable as possible. Both hands should be practiced

in introducing sound or catheter, and the nurse should keep his elbow supported during most of the operation, in order that his hand may be more steady. If the right hand is used, place yourself at the patient's left, and vice versa. Select the proper size, beginning with lowest number. See that the instrument is clean, smooth, and, if it is a flexible catheter, pervious. Warm and oil it before introducing into the urethra, bearing in mind the course of the urethra.

First Movement.—Keep the catheter in the middle line. The shaft of the instrument is held over the fold of the groin, its handle nearly in contract with the skin, from which latter it is not to be moved away until the point of the instrument is about to enter the fixed portion of the urethra. The instrument, at first held along the groin with its point high and handle low, is entered at the meatus, and the penis is molded over it. It is not pushed, but the urethra is made to swallow the instrument, as it were.

Second Movement.—When the curve, and perhaps an inch of the shaft, has disappeared within the meatus, the handle of the instrument is swept around the surface of the belly so as to be exactly over the center of abdomen, parallel with it and still close to the integument. The whole shaft of the instrument is now to be gently pressed towards the Linea Alba, being still kept close and parallel with the surface of body (the penis meanwhile being lightly grasped behind the corona glandis and held steady). The point of the instrument should be followed with the little finger of the hand which manages the penis, and, when it gets fairly past the angle, the whole scrotum, with the testicles and penis, should be largely seized with the

hand and pressed up against the pubis, with slight upward traction. The point may now be felt to settle down and adapt itself to the sub-pubic curve, whence on the weight of the instrument, properly directed, should carry it into the bladder.

Third Movement.—As soon as the curve lies well against the symphysis, the scrotum, testicles and penis should be dropped; the hand which held them takes the instrument, simply steadies it in the median line and gradually carries the shaft away from the abdomen, making the handle describe the arc of a circle and depressing the shaft between the thighs until it lies nearly in the same plane with them. No pushing movement should be imparted to the instrument during this time. The handle is simply made to describe the arc of a circle, and the point, in a healthy urethra, can not go astray.

Fourth Movement.—While the instrument is being depressed between the thighs, the free hand is employed pressing down upon the mons veneris and root of the penis to stretch the suspensory ligament. When the instrument is inside the bladder, its point may be moved freely from side to side by partly rotating the handle.

How to Withdraw Sound.—The instrument should be withdrawn with the same slowness and care with which it was introduced. No traction is needed. The motions used in introduction are simply reversed. The handle of the instrument is lightly caught, and without traction made to describe the arc of a circle until it touches the abdomen over the linea alba. It is then carried around to the groin, and, by a tilting motion, unhooked from the urethra, ending exactly where it

commenced, along the groin, the handle low, the point high.

How to Get Through a Tight Stricture.—Try a small, soft, olive-pointed catheter or a small steel sound. That failing, electrolysis may succeed. Finally several filiforms should be passed into the urethra, and each manipulated in turn till one passes into the bladder. This may be threaded upon a railroad catheter and the latter forced through the stricture without fear of making a false passage.

How to Retain Catheter in Male Bladder.—Having ascertained that the catheter is in the required position, attach two pieces of narrow tape to the rings of the instrument, bring them down, one on each side of the penis, and secure them by strips of adhesive plaster passing around the organ.

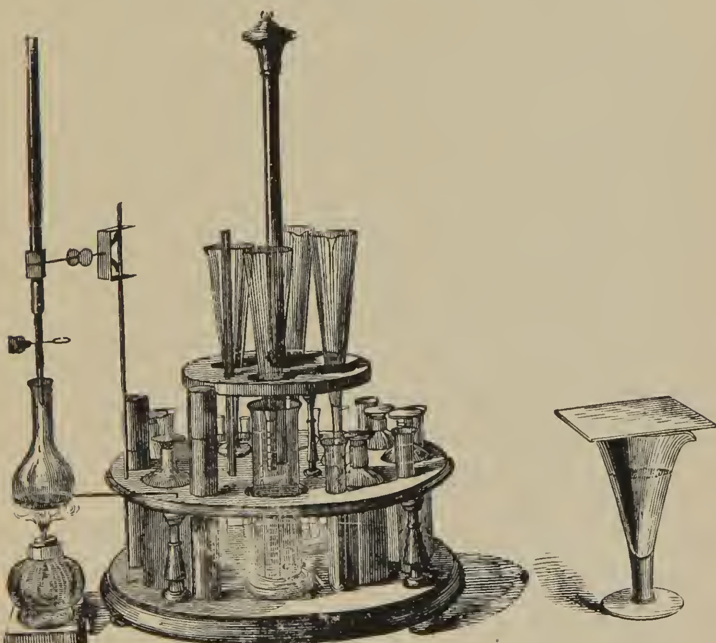
The same object may be effected in the following manner:

First apply a single turn of bandage around the patient's waist. Next take an ivory ring of suitable size, and to this attach four pieces of narrow tape, each about a yard long. Then pass the ring down to the root of the penis and bring two of the tapes up in front, one along each groin, and fasten them to the waistband. The other two tapes conduct backwards under the perineum, across the folds of the buttock, and tie them to the waistband. In this way the ring is secured and affords a fixed point to which the catheter may be attached. In both these instances the knot should be placed at the patient's side, for in this situation they will cause no discomfort, and the surgeon will be able to reach them without difficulty. A similar piece of tape about half a yard long is attached

by its center around the neck of the catheter or fastened to its rings, and the ends are brought down, one on each side, and tied to the ivory ring.

The nurse should see that the orifice of the catheter is furnished with a wooden peg, which the patient can remove at pleasure when he wishes to evacuate.

The Examination of Urine is very important, owing to its being a valuable guide not only to the diagnosis of the different renal diseases, but to many general disorders of the system.



Selecing a Specimen.—In obtaining a specimen of urine for examination, it should, as far as possible, be

a part of the whole twenty-four hours' urine, as the specific gravity, reaction and other properties are well known to vary during twenty-four hours, and the only accurate method is, therefore, to take a part of the total. When this is not possible, circumstances determine the selection. Thus, when a small quantity of albumen is present in urine it is often increased after a meal and sometimes when there is no trace apparent in the morning urine a little will be detectable after a meal. The same is true of sugar. The physician must therefore be asked for his judgment in the selection of a specimen. In figure are represented forms of glass vessels used for measuring large quantities of urine and keeping it air-tight by coverings.

Urine kept in a warm place soon passes into putrefaction, and then is not suited for analysis. With putrefaction some organic deposits, as blood, tube casts and renal epithelium, are altered, if not broken up, by urines of low density.

Quantity Passed in Twenty-four Hours.—The mean daily discharge is 1250 c. c. or f℥ 40-50, or 2½ pints.

Color.—Dr. Flint recommends as being very very convenient the use of pieces of colored paper, gummed on the back, that will represent approximately the color of the specimen as it appears in the vessel for taking specific gravity. A small piece of paper is cut off and attached to the record, with the remark clear or turbid, as the case may be. The amount of color usually depends simply on the extent to which the urine is diluted. It ought to be clear when passed. The milky cloudiness, often very dense, which only appears as the urine cools, is usually as unimportant as

it is popularly alarming; but if it is turbid when passed it must be kept for examination. There is also a peculiar smoky tint that indicates the presence of blood, which it would be well for you to recognize.

Odor.—With regard to odor, it may be noted as normal, strongly or feebly urinous, sweetish, ammoniacal, fetid, or by some term that will indicate any extraneous odorous principle. It is easy to detect a departure from the familiar odor of health. Some articles of food, as asparagus, and some aromatic medicines, impart a change. Saccharine has a fruity odor. Putrid urine has the odor of ammonia, modified.

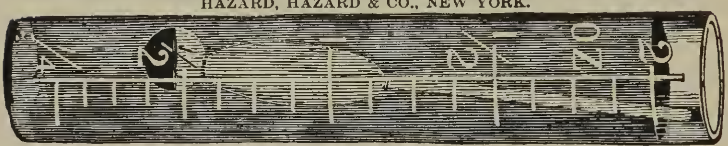
Reaction.—The most convenient method of determining the reaction of the urine is by delicately-tinted blue litmus paper for acid urine and faintly reddened litmus for alkaline urine. First, put a drop of the sample on a piece of blue litmus paper; if the blue turns to red, then the reaction is acid; if the paper is unchanged, then it will be alkaline or neutral. Now try it with red litmus paper; if it turns blue, the reaction is alkaline; if the paper is unchanged, the urine is neutral. The reaction of normal mixed urine—that is, the urine of the entire twenty-four hours — is always acid. And, generally, specimens of urine passed at any time of day exhibit this reaction, though there is a difference in its degree, while after a meal the urine may become neutral or even alkaline.

Specific Gravity.—To determine the specific gravity the so-called urinometer is invariably used. (Fig.) Every urinometer should first be tested with distilled water at 60° Fahr. (15.54° C.), into which it should sink to the mark 0 or 1000. In its graduation the lines indicating the degree should gradually approach

each other as the bulb is reached, because allowance must be made for the weight of the stem above water. The temperature at which the gravity is usually determised is 60° Fahr. (15.4° C.) If the urine be of a different temperature, cool it by immersing the vessel in cold water, or warm it until 60° is reached.

In taking the specific gravity, if the containing vessel has a level lip at its mouth, the most accurate reading is made by immersing the urinometer while the vessel is half full of urine and then carefully filling it to the brim. The exact line of the registry can be taken by sighting horizontally the surface of the urine which rises slightly above the stem of the instrument.

HAZARD, HAZARD & CO., NEW YORK.



Solid Constituents.—From the specific gravity of urine a rough estimate may be formcd of the percentage of solid constituents contained in it. The most accurate and simplest formula for this purpose is that proposed by "Trapp." According to this, if the two last figures of the specific gravity be doubled the quotient will represent the amount of solid matter per ·1000. A thougrains of urine with a specific gravity of 1020 will therefore contain 40 grams of solid in 1000 c. c. If the, specific gravity is high, suspect sugar; if low, suspect albumen. The healthy standard is between 1015 and 1025.

Pathology of Urine.—In health the composition of the urine in 1000 parts may roughly be estimated as follows:

	Water,		950
	Urea,		25
	Uric acid,		1
Fixed Salts.	Chloride of Sodium. Salts of Ammonia Alkaline Phosphates. Alkaline Sulphates. Phosphates of Lime and Magnesia.		14
Organic Matters.	Extractive. Creatine and Creatinine. Coloring matter.		10
			1000

There are two tests which if used together will easily and certainly determine the presence or absence of albumen in urine, and these are heat and nitric acid.

Nitric Acid Test for Albumen.—Put one inch of urine in a test tube and gradually run ¼ inch nitric acid down the side, while the tube is inclined, so as to prevent mixing. The acid is heavier and forms a bottom layer. Wait some minutes for the appearance

of a white belt or zone at the line of contact of urine and acid. This is a coagulum of albumen. Although this is not the most delicate test, it is highly convenient, and albuminuria is rarely serious unless decided enough to be shown by this "contact" method.

Heat Test for Albumen.—First test the reaction. If acid, proceed at once to apply heat. If the urine be alkaline, then to a tube containing 3 inches of urine add one drop of acetic acid. Heat the upper half to boiling. If contrasted with the lower half it has a turbid appearance; then albumen is present. It coagulates in acid fluids at 70° C. (160° F.), but remains dissolved if the urine is alkaline. Serum albumen and its associate globulin are the only proteids that coagulate at this temperature.

Precaution.—Sometimes when acetic acid is added to a urine already acid the albumen is converted into acid albumen, a form non-coagulable even on boiling. The acetic acid should not be employed except in an alkaline urine, and even then only a drop, just enough to neutralize the reaction or make it slightly acid.

Approximate Estimation of Albumen in Urine. The urine acidulated by a drop of acetic acid is boiled for several minutes and set aside for 24 hours. White flakes fall in a well-defined layer, the depth of which may be expressed as a fraction of the whole fluid in the tube, thus: It is 1-10 or ¼ albuminous layer.

Tests for Sugar.—Of the large number of tests for the detection of sugar only those will be given which have borne the trial of experience, and I would suggest that for practical purposes the nurse should selct some one of these and accustom himself to its

use and to the modifications in results to which all are more or less subject.

In the application of any test but that of picric acid, it is necessary to make sure that the urine is free from albumen. If any is present, boil the sample with a drop of acetic acid and filter.

Moore's Test.—Moore's test depends upon the fact that glucose, with which diabetic sugar is identical, becomes oxidized when boiled in contact with caustic alkali, taking the oxygen from the atmosphere.

To a small quantity of urine in a test tube add half as much liquor potassæ, or liquor sodæ and boil. If glucose is present, a yellowish brown color soon makes its appearance, which becomes more intense as the boiling is continued, and which will be the deeper the larger the proportion of sugar, becoming finally almost black if the quantity is large. The flaky precipitate which is observed after the addition of the alkali, and is increased on the application of heat, consists of the earthy phosphates, which, if very abundant, may be filtered off before the heat is applied.

For the successful operation of Moore's test there should be at least 3 per cent. of sugar in the urine, or 1½ grains to the fluid ounce.

Fehling's Test.—Fehling's solution contains sulphate of copper, 90½ grains; neutral tartrate of potash, 364 grains; solution of caustic soda (specific gravity 1-2), 4 ounces, water being added to make up exactly six ounces. One grain of sugar exactly decomposes 200 grains of this solution.

Boil in test tube 1 inch of above solution while hot. If it remain perfectly clear, add a little urine (10–20 drops) and bring to a boil again. If no yellow or red

color appears, add more urine until the volume is 1¾ inches; again raise to boiling point and set aside. If yellow or red cuprous oxide appears, the urine is saccharine.

Precautions.—Let the volume of urine be less than that of the test solution. Heat up to the boiling point without continuing the boiling. If these precautions are not observed, high-colored, acid, dense urine may reduce the copper sulphate without the presence of sugar.

Bottger's Test.—This consists in adding to urine an equal volume of liquor potassæ or sodæ, then a pinch of the ordinary subnitrate of bismuth, shaking and boiling for a couple of minutes. The sugar possesses the power of reducing the salts of bismuth, and if sugar is present the black, metallic bismuth will shortly be deposited on the side of the test tube. If the quantity of sugar is small the bismuth will assume a grayish hue; hence, when this is the case, a very small amount of bismuth should be used in making the test. This is a brilliant test, and, except albumen or other substance containing sulphur, nothing but sugar is supposed to reduce bismuth salts. To meet this especial care must be taken to remove the albumen before applying the bismuth test.

Picric Acid and Potash Test.—Into a test tube, graduated up to three drachms, is put about one-third of a grain of picric acid—as much as can be carried on the point of a pen knife. Then add half a drachm of water. The acid is dissolved in the water by the heat of a lamp. Now add half a drachm of urine, and the presence of albumen is ascertained. Next add a grain

lump of caustic potash, and boil the liquid for a few seconds, and the dark coloration appears.

Quantitative Test for Sugar by Fermentation, and the Specific Gravity. — Take two measured specimens from the 24 hours urine, and to one add a little yeast; place each specimen in a temperature of 75°–80° Fahr. In 24 hours, fermentation having destroyed the sugar in the one containing the yeast, the difference in the specific gravity of the two specimens expresses the number of grains in each ounce of urine, approximately.

Test for Blood by Heat and Nitric Acid.— (Urine red or of dingy or smoky hue). Heat or nitric acid causes deposit of albumen, with the coloring matter changed to a dirty brown. The diagnosis can be made with certainty only by the microscope.

Test for Bile by Fuming or Red Nitric Acid. — Allow a specimen of urine and a few drops of red fuming nitric acid to gradually intermingle on a porcelain dish, and a play of colors—green, blue, violet, red and yellow or brown—occurs, if biliary coloring matter be present.

Form for recording urinary examination (to be printed or written on a full letter sheet):

EXAMINATION OF URINE.

For Doctor............................

By Nurse...............................

Patient.................................

PHYSICAL AND CHEMICAL CHARACTERS.

Total quantity in 24 hours.............

Color ....

Odor................................

Reaction ....

Specific Gravity....................

Albumen ....

Sugar ....

Quantity and general appearance of deposit..............................

DEFECATION.

Examination.—The examination of the intestinal evacuation should but seldom be omitted in any case, and never in obstinate and severe diseases.

Patient's Assertions.—A patient will often assert that the bowels are open daily, when the evacuations are very scant and quite insufficient to prevent a large fæcal accumulation.

Character.—Besides ascertaining the existence or non-existence of constipation, the nurse should know the color of the movements, their consistency and nature.

Frequency.—The frequency of the evacuation will vary with the age and mode of living. Children at the breast evacuate the bowels several times a day, adults once, and old people and those of sedentary habits more rarely.

Serious Trouble.—Serious trouble in defecation may arise from excessive as well as from weakened action of the muscles concerned in the function. The sphincter may be irritable or subject to spasm and resist too

forcibly the expulsive action of the defecations; or the muscular fibres of the rectum may lose their tone, be defective in power and incapable of properly extruding the fæces. Patients when thus situated are often obliged when at stool to use the finger to dislodge masses retained in the weakened bowel.

Atonic Condition.—An atonic condition of the rectum usually arises from over-distention. It may be be induced by too free and frequent use of enematas, the quantity injected being so large as to dilate the bowel and impair the powers of its muscular coat.

Fæcal Accumulations.—The atonic state of the bowel is apt to give rise to fæcal accumulation. Such collection gives rise to considerable distress, producing constipation, a sensation of weight and fullness in the rectum. In cases of some duration, where the hardened fæces do not quite obstruct the passage, they excite irritation and a mucous discharge, which, mixing with recent feculant matter passing over the lumps, cause the case to be mistaken for diarrhœa.

Injections.—Injections have no effect in softening the indurated mass. They act only on the surface and return immediately, there being no room for their lodgement in the bowel. The nurse, by passing his finger, finds tne rectum blocked with a large lump which feels almost as hard as stone. In such cases the only mode of giving relief is by mechanical interference. The mass requires to be broken up and scooped away. After the breaking up and extraction of the larger portions, injections of soap and water will be sufficient for the removal of the remainder.

Varieties of Diarrhœa.—Physicians distinguish various kinds of diarrhœa as:

Crapulosa.—When the fæces pass of ordinary quality, but immoderately loose and copious.

Biliosa.—When the bile is more abundant than natural.

Mucosa.—When the excrement contains a quantity of mucous.

Serosa.—In which they are almost entirely liquid and watery.

Lientera.—When the food passes through the body in an almost unaltered state.

Bed Pan.—A bed pan should always be dipped in hot water and dried carefully before being used, as this will make it just sufficiently warm and will avoid chilling the patient. Always keep a little disenfecting solution in it, in order to lessen smell, which is always disagreeable.

THIRST AND ITS ALLEVIATION.

Thirst is a sensation indicating a necessity on the system for an increased supply of water, as appetite shows there is need for the introduction of food. Although the sensation is referred to the back of the throat, it is not a purely local feeling, as is proved by the fact that it cannot be allayed by the swallowing of water unless the fluid reaches the stomach and is absorbed. It is always present in the febrile disorders, an increased supply of liquor being required, both to reduce the heat by promoting the evaporation of moisture from the skin and linings and also to wash away the products cf the incrusted tissue changes that accompany those complaints. In like manner it is always present when much fluid has been extracted

from the system. Thus it shows itself after all surgical operations attended by hæmorrhage. It is a prominent symptom in cholera and diarrhœa, in which diseases large quantities of serum are rapidly removed from the gastro-intestinal circulation; and it is equally so in diabetes, where fluid is largely excreted along with sugar by the urinary organs. A craving for cold acid drinks presents itself in acute gastritis, the intensity of the thirst being perhaps due to the incessant vomiting, which prevents fluid remaining long enough in the stomach to be absorbed.

Alleviation.—Thirst is relieved by the agents usually recognized as refrigerants, such as water, barley water, toast water and similar drinks, sucking small pieces of ice, effervescing drinks, freshly diluted acid drinks, especially those made with the vegetable acids, the juices of fruit, or these made into drinks.

Caution.—Care has to be evercised in the employment of these apparently harmless agents, and their consumption has to be regulated by the physician. Otherwise patients may take them to excess and may thus do themselves considerable injury.

How to Preserve Ice.—To prevent the supply of ice that is in the sick room from melting too rapidly the following simple and ingenious contrivance has been suggested: Cut a piece of flannel large enough to dip funnelwise half way down an empty tumbler sufficiently to allow of its being secured by an elastic band or piece of string tied around the top of the glass. Place the ice, broken ready for use, in the flannel cup and lay a flannel cover over the top. As the ice melts the water drains through the funnel and falls to the bottom of the glass. Should the funnel be

not of sufficiently open texture for the water to pass through quickly, a number of small holes must be made in it. If the ice is allowed to stand in the water it melts very quickly, so that it is preserved longer by drawing the water off as fast as it is formed.

How to Break Ice.—It is a very wasteful and noisy habit to break it with a hammer. The proper plan is to split off the size needed with a strong pin. If there should be no ice chest for the preservation of ice not required for immediate use, fold it in a piece of flannel and carry it to the cellar or some other equally cool place.

COUGH, EXPECTORATION, HICCOUGH AND VOMITING.

Cough.—The act of coughing consists in the act of one or more forcible expirations, accompanied by contraction of the glottis. First a deep inspiration is taken, the glottis is closed for a moment, then it is opened by the pressure of the air forced out by the combined action of the thoracic and abdominal expiratory muscles. With the air thus suddenly expelled any foreign matter that may be in the larynx or bronchi is driven into the pharynx or mouth.

Varieties of Cough.—The character of the cough is quite often pathognomonic, *e.g.*, the "whoops" of whooping cough, the "bark" of hysteria, the "catching," painful cough of pleurisy, the slight "hack" of early phthisis, the loud, "clanging" cough due to pressure on the trachea, and the "spasmodic," suffocative cough of asthma.

How to Cough.—Patients may be taught "how to cough." Try to suppress the inclination until the

secretion that causes the cough is within reach. Then take a deep and deliberate inspiration and the accumulated phlegm is removed at a single effort. By inhaling steam from a hot sponge or basin of boiling water on first waking from sleep the inspissated secretion, which is apt to be difficult to move, may easily be loosened and expelled.

Expectoration.—The word, which strictly means the act of expelling anything from the chest, is usually applied to the matter so expelled, which is also called sputum or phlegm. Inability to expectorate is often the immediate cause of death, the "suffocative catarrh" of the dying being another name for the accumulation of phlegm which the patient is powerless to remove. By teaching the patient how to expectorate, by the administration of a timely stimulant or a quickly-acting emetic, or even by a change of posture, life in such a case may be prolonged.

Aids to Diagnosis.—The expectoration affords important aids in diagnosis, as may be illustrated by the following examples: If a patient with severe pain in chest cough frequently and spit only frothy salivary fluid, we may suspect pleurisy; if the fluid is glairy like the white of an egg, we may suspect bronchitis; if it has a rusty tinge and resembles thick gum water covered with blood, we are not likely to err in suspecting pneumonia; if there is a sudden gust of fetid pus, we may suspect abscess in the lungs or empyema.

Hiccough or Hiccup is produced by direct or by reflex irritation. With many persons the introduction of hot, spiced or peppery food into the stomach immediately produces hiccough. If we can succeed in producing a forcible action of the diaphragm we may often

succeed in curing it, as it were, of the trick of spasmodic action. Attempts to count a hundred without drawing breath, or to hold the breath for a minute, are familiar remedies for hiccough, and by producing a feeling of suffocation and necessitating a violent descent of the diaphragm they are often successful.

Vomiting.—Forcible expulsion of the contents of the stomach through the æsophagus. The contents of the stomach are expelled from it by the mechanical pressure brought to bear on it by the diaphragm and abdominal parietes, which contract simultaneously. When the muscles contract, if the cardiac orifice of the stomach remain closed, an ineffectual effort at vomiting or retching occurs, but if the cardiac orifice dilate the gastric contents are expelled.

Seasickness.—In seasickness the effect of the position of the head is sometimes very marked, and the vomiting may sometimes be arrested completely by removing all pillows and putting the head on a level or lower than the body. When vomiting is due to the slow, improper digestion which allows decomposition or fermentation of food to take place in the stomach, it may be arrested by improving the digestion. When the repeated vomiting interferes with the giving of food, the proper course is to withhold food altogether for an hour or two, so as to allow the stomach a little rest. Then a very small quantity—for example, a tea or tablespoonful of ice cold water—should be tried, and if this is kept on the stomach it should be tried every ten minutes or quarter of an hour. As the sickness abates the intervals may be constantly lengthened and the fluid increased until the patient is able to return to his customary diet. In cases of persistent sickness

small pieces of ice given to the patient often help to allay the irritability of the stomach, besides relieving the distressing thirst.

SORDES.

Sordes.—Crusts which foim upon the teeth and lips of persons suffering from extreme exhaustion. Sordes occur in what is commonly called the typhoid state, whether this be due to typhoid, pneumonia or any like disease. They appear first as thin, light, yellowish crusts upon the prolabia, generally in close proximity to the teeth, gradually increase in thickness and in area and changing their color to brown or even black, at length extend to the adjacent surfaces of the teeth.

Treatment.—Sordes are composed of various germs mingled with food and epithelium. These organisms, which are of constant occurrence on the papillary surface of the healthy tongue, are easily dislodged from the smooth lips and teeth, but in conditions of great prostration, especially when the prostration is associated with delerium, the slight friction necessary for their removal is not made, and they obtain so firm a hold that they can only be removed by careful and repeated cleansing. The mouth should often be washed and the teeth brushed or wiped off with a bit of soft cloth. Water containing a few drops tincture myrrh, or of Condy's fluid, is good to rinse out the mouth. To remove sordes from the teeth a mixture of lemon juice, glycerine and ice water in equal parts will be found efficacious.

GARGLES.

Gargles are liquids employed for the production of local effects on the throat and pharynx.

Gargling.—This consists in taking about a spoonful, more or less, of the gargle into the mouth, throwing back the head and agitating the liquid by the air expelled through the pharynx. With some persons the gargle goes little beyond the uvula and base of the tongue, but if the head be well thrown back the fluid can be made to pass into the cavity of the pharynx and may even reach the larynx and vocal cords.

Uses.—The use of the gargle is contra indicated in inflammation of the tonsils and in all cases where the movements of fauces cause severe pain, and where, as in some persons, an inability exists to retain liquid beyond the anterior pillars of the fauces, for these it is more convenient to apply the fluid to the fauces and pharynx, either by injection or in the form of a medicated spray, or else by aid of a brush or sponge.

DAILY REPORT OF THE PATIENT'S CONDITION.

The Nurse.—The nurse is the medium between the physician and the patient, having from his constant attendance on the patient the best opportunity of observing all phases of the disease which are of importance to the physician and which are often overlooked by the patient or his friends, concealed from notions of false modesty or over-estimated from too great anxiety. In all reports the main point is truthfulness, without reserve.

Opinions and Conjectures.—Nurses often fall into the error of expressing their opinions and conjectures concerning the disease and its cause, or, from talkativeness or conceit, discussing the disease with the

physician, at the same time assuming a behavior as if their own sagacity had discovered the cause of the disease. This is in every way censurable, as it is the physician's and not the nurse's place to investigate and judge of the disease. Furthermore, such occupation on the part of the nurse oniy serves to distract him and to draw his attention from his real, important duty to observe the patient.

Errors.—The nurse should never mislead the physician, and when questioned by the latter concerning things he has failed to observe must confess either his ignorance or negligence. It is better to confess an error than to falsify, which may lead the physician into modifying his treatment. No answer is preferable to an uncertain one.

Private Information.—When the patient gives information to the nurse which it is desirable the friends or, in hospitals, other patients, should not hear, this should be communicated privately to the physician.

Observations and Record.—In regard to medicines administered, the nurse having been informed of the effect intended, should observe the result, as, for instance, whether cough is relieved or aggravated, etc. It is advisable that the nurse should record all symptoms observed, temperature, time of giving medicine, etc., on a chart (such as illustration).

In all diseases, without exception, the following conditions must be observed and noted:

The Position of the Patient.—On which side, or on the back, semi-recumbent; whether he is restless, tossing about or gliding towards the foot end, as in comatose patients.

WARD. NAME. DIAGNOSIS.

Date	Hour	Temp	Pulse	Resp.	96	97	98	99	100	101	102	103	104	105	106	Treatment	Urine.	Sto'ls	Remarks.

The Behavior of the Patient. — Whether uncommonly quiet and low spirited or the reverse, very restless and violent or delerious.

The Countenance.—Any alteration in this must be carefully noted. Excessive pallor, for instance, may be the first indication of syncope or hæmorrhage.

Sleep.—This is of the greatest importance, especially as the physician seldom has the opportunity of observing the patient during it and must rely soly on the nurse. Instead of a calm, natural sleep the patient's sleep may be either too long and deep, or, on the other hand, too restless. The latter is frequently combined with other symptoms, such as sudden spasms, sleeping with half open eyes, gnashing of teeth, picking of the bed clothes, delirium, dreams, etc. Involuntary evacuation during sleep is also to be noted.

Respiration.—Whether easy or labored, how frequent, whether accompanied with stitches in the side or rales, whether the patient is compelled to sit up in bed, or lie on the side or back.

The Skin or Surface of the Body.—Whether cold or warm, whether certain portions are colder, others hot, whether chills alternate with fever and perspiration. In observing the latter, whether it is uniform over the whole body or only a part of it, the appearance of an eruption, swelling or the premonitory symptoms of bed sores, are to be carefully noted; also the quantity and quality of discharges from ulcers, wounds, etc.

Appetite and Thirst.—The former, whether entirely absent or immoderate or depraved; the latter, whether great or entirely absent, notwithstanding a dry tongue and lips.

Evacuations.—The frequency, color and consistency of the stools must be noted, and if patient experiences pain or discomfort in passing it.

Pain.—Pain and other attacks are to be noted as to when they commenced, their duration, cause and as they are described by the patient.

Injuries.—In case of injuries, etc., the additional points to be observed will be designated by the surgeon.

THE ADMINISTRATION OF ANÆSTHETICS.

Since the nurse when on private duty will frequently have to administer anæsthetics, it may be well to mention a few points of importance in connecticn with the subject.

Caution.—Whenever possible care should be taken that the patient does not eat solid food for four hours prior to the operation, since the neglect of this precaution may entail more serious results than the troublesome vomiting and nausea, there being good grounds for believing that in the presence of a distended stomach the heart is more liable to paralysis when patient is under the influence of an anæsthetic. At the same time it is a great mistake for a patient to become exhausted from want of food before an operation; and this is too often the case in hospitals, where the breakfast hour is seven or eight and the operation may not be performed till two or three o'clock. It is a good practice to give the patient a cup of beef tea three hours before operation, and this tends to decrease the liability to sickness, as well as the great danger of fainting.

Chloroform.— Although chloroform may be satisfactorily administered on a handkerchief, there can be no question that an inhaler renders the operation less dangerous, particularly in the hands of those not much accustomed to the use of the anæsthetic.

Ether has of late been re-introduced into surgical practice in preference to chloroform, on account of its being safer than the latter. It is also less depressing in its effect and less liable to induce sickness, and hence is employed after severe accidents, when the system has received a considerable shock. Ether may be administered with an inhaler or simply on a napkin folded into a cone and covered with oil silk to prevent evaporation. Ether vapor is very heavy, and therefore the napkin holding it should be held above the nose and mouth and so arranged that a considerable portion of the expired air is breathed again.

Practical Differences. — Certain practical differences between different patients are to be noticed, the most important of them being the distinction between those who do and those who do not pass through a stage of strong muscular excitement or convulsions. Setting aside all voluntary struggling, from fright, etc., in the cases where there is a violent struggling of an involuntary kind after consciousness is lost, the right course is to push the anæsthetic very decidedly so as to allow the patient to breathe the whole strength of the vapor. Inexperienced bystanders are apt to be terrified by the appearance which a patient presents when struggling violently, with the features swollen and the eyes suffused, and to fancy that his safety demands an intermission of the inhalation. This congestion, however, is caused entirely by the spasm of

various muscles and by the spasmodic catching of the breath, and the right course is to continue the administration until the spasm ceases, which it will soon do, and the patient's countenance will then at once become calm and of a natural color.

Watchfulness.—At all times whilst giving an anæsthetic it is necessary to keep a constant watch upon the pulse, which furnishes one very useful indication of the extent to which the anæsthetic has taken effect. Since the administrator should keep a finger on the pulse, any failure in the heart's action will be at once recognized, and inhalation should be at once suspended until it has recovered itself. So long as the breathing is tranquil and even, but not too slow, the noisy respirations of some patients need excite no alarm, any more than an occasional catching of the breath. It is often found that if the chin is raised as far as posible from the sternum the sounds of obstruction cease, and this should always be tried before catching hold of the tongue with tongue or dressing forceps. It is only when difficulties of respiration are combined with pallor of the face or a failing pulse that they become really alarming, and the breathing will then be noticed to take place in gasps.

Apprehended Danger and Treatment. — In all cases of apprehended danger the inhalation should be at once suspended, and unless the pulse and breathing recover themselves immediately artificial respiration should be had recourse to without a moment's delay. There appears to be a disposition in many of these cases for the tongue to drop or be drawn back so as to obstruct the orifice of the larynx; it should therefore be firmly grasped with the fingers or forceps and drawn

out of the mouth, so that there may be free access of air to the lungs. A current of fresh air should be freely admitted by throwing open the windows and by not allowing bystanders to crowd around the patient, and cold water may be dashed over the chest as an auxiliary measure to assist in producing a forcible inspiration. No anæsthetic should ever be given except under the directions, and if at all possible, in the presence, of a physician or surgeon.

INFLAMMATORY PROCESS.

Inflammation.—This strange ally or enemy has by universal consent received a name in nearly every civilized language, implying the same thing. It is called inflammation, and as its etymology implies it is in its essence a process of burning, and, like fire, it is a good servant but a bad master. The process is in its beginning entirely healthful and absclutely useful and essential. In its excess or maldirection it is productive of the most dire results. Without it, in its early stages, no wound would heal, no bone when broken would unite, repair would be at a standstill; with too much of it, or with its energy misdirected, all sorts of miseries, misfortunes, up to the death of the part or person, will follow.

This process, then, of inflammation we must understand if we are to understand anything aright.

Symptoms and Course.—This is an example of a simple, uncomplicated kind, which will explain what happens and what the symptoms mean. An unaccustomed hand has in an emergency to take an oar after a shipwreck. In a few minutes, when stopping to rest, he looks at the palm of his hand and sees it red

and swollen; he feels it hot, and it will soon be painful. If he can stop and take a rest all these symptoms will soon pass off; the hand will not be damaged; the process has not gone beyond health. But no, he cannot stop, he must go on, and soon the swollen skin will begin to swell more; its cuticle will be elevated into a bleb or blister and fluid will be seen under the cuticle. Still he must pull, and in a few hours more the injured cuticle will peel off and the skin will suppurate, i. e., discharge blood and matter, then ulcerate, and in time even a piece of skin or tissue below may die, i. e., gangrene has taken place.

Pathology of Inflammation.—The part is red because too full of red blood; it is swollen because this blood, serum or leucocytes are all in addition to its normal size; it is painful in great measure because it is swollen and tension is caused. The greater heat in an inflamed part is owing partly to the excess of blood and partly to the destructive tissue changes, really acting as a fire, while the hot part will soon make the patient a hot person — just as a little stove at one corner of a range of hot houses by heating the water in the pipes will gradually heat the whole range of houses and keep them hot so long as the fire burns.

Local Treatment of Inflammation.—

1. Remove the cause.

2. Rest, either general, putting the patient in bed, or local by the employment of splints and bandages.

3. Position.—Elevation, with relaxation of all structures, by position.

4. Cold.—May be employed with or without moisture, ice bag, irrigation; rubber tubes, cold compresses and evaporating lotions.

5. Heat.—May be combined with moisture; hot cans or bottles, poultices, spongio piline, irrigation, baths, douches.

6. Pressure.—Either direct or on the main blood vessel of the part.

7. Local Depletion—Cups, leeches and scarification.

8. Counter-Irritation.—Tincture iodine, mustard plaster, turpentine, chloroform, liniment, actual cautery, seton, issue.

9. Vesication.—Fly blister, cantharidal collodion.

Caution.—One caution here of special value to a nurse. When heat is ordered persevere with it, for the sudden alteration from heat to cold and back to heat again, caused by ill applied or irregular poulticing, is very injurious.

Suppuration.—The stage of the inflammatory process to which the name of suppuration has been given is chiefly characterized by the presence in the tissues and on the surface of the inflamed part of a peculiar fluid called pus. Pus is a thick, creamy fluid of a yellowish color, alkaline in reaction, tasteless and devoid of smell, often mixed with blood from the ruptured or divided vessels of the part.

For practical purposes suppuration is divided into:

1. Discharges, i. e., suppuration from the surface of a part, of which an excellent familiar example is that from a blister; and

2. Abscess, i. e., suppuration occurring in the tissues.

1. **Discharges.**—Sometimes kept up artificially for purposes of treatment. This does not necessarily imply any permanent loss of substance in the part; the

irritant keeps up the proliferation of the cellular elements of the tissue and the escape of the leucocytes from the blood, but on the irritant being removed the part will heal and may leave no scar. When tissue elements are destroyed and permanent damage begun the process is called ulceration. (See page 198).

Treatment.—If a nurse is ordered to keep up a suppuration the greatest cleanliness is necessary, frequent dressing with water dressings and the occasional application of the irritant as directed. Discharges from mucous membranes, as dysentery, etc., are sometimes very tedious, weakening to the patient and need special treatment.

2. **Abscess** is described under the head of: (1) acute, or (2) chronic limited abscess, and (3) abscess unlimited, or phlegmonous erysipelas.

(1) **Acute Abscess.**—When pus forms, even in very small quantity, in a deep part we find all the inflammatory symptoms rapidly exaggerated; pain severe, with a throbbing character, i. e., each pulse beat adds to the tension and is represented at the part by a tiny impulse or wave; heat, both of part and patient, exaggerated quickly; redness may not be much visibly increased unless the part is superficial, but the blood fullness is there more marked if we could see it. Swelling: This is not only much increased but altered in shape; it becomes more soft and projecting in its center, while the circumference feels harder, like a wall of brawny tissue round the soft center. To this change, and to the peculiar sensation to the fingers resulting, is given the name fluctuation, a condition much more easy to show than to describe. To make it out you must use both hands, or, in a small abscess,

the tips of one or more fingers of both hands, and you must learn to do it thus: Keeping one hand or finger tip—the left one—quite still at the edge of the swelling, you must gently tap or percuss with the other, and this will elicit the feeling of movement in the fluid below, which is soon communicated to the resting finger. One marked symptom which assists in the diagnosis of abscess is the rigor which accompanies the first pus formation; that is, the patient has a sense of chilliness, varying in amount from a small momentary shiver down the back up to a convulsion of chilliness which will shake the bed and which may last for a quarter of an hour or half an hour, notwithstanding you lay clothes on him, surround him with hot bottles and pour brandy down his throat. Such a rigor we will see heralds severe pyæmia or septicæmia.

Treatment.—Surgeons endeavor to abort formation by ordering the use of heat (110°), cold, local depletion or blisters. If these fail tension is relieved and suppuration hastened by poulticing. When fluctuation is detected he opens, under antiseptic precaution, washes out the cavity with antiseptic solution, drains and applies dressing.

Fistula.—A danger in leaving abscesses to themselves is that if in the vicinity of mucous canals or of serous cavities they often tend to open into them, and thus result in the formation of a fistula, if into a mucous canal; or in setting up peritonitis or pleurisy, if into the serous cavity.

(2) **Chronic Abscess.**—These, often connected with diseased glands, bones and joints, are insidious in their progress and are apt to be unnoticed and neglected till far advanced. There is little pain, and, till opened,

generally very little constitutional disturbance. They often contain curdy masses (caseated gland material, etc.) in thin, serous pus. They are apt to become putrid after opening, and the defective vitality of their walls and the manner in which they have displaced the surrounding parts makes healing slow and doubtful The older surgeons used to fear them and delay their opening as long as possible. Now, with antisepeic precautions, they are feared less, yet still to treat a chronic abscess safely will tax all the surgeon's knowledge and require all the nurse's care.

(3) **Abscess Unlimited.**—This is found in certain forms of erysipelas. In this the suppuration is rapidly formed in the cellular tissue of a part or in one of a chain of glands. It generally results from some infection or putrefactive change. It is characterized by the complete absence of the hard ring of thickened cellular tissue, which is described as surrounding the soft center of an acute abscess, and in consequence of this absence nothing stops the progress of the suppuration along the tissues. It spreads with rapidity, does not tend to point and, unless promptly and efficiently attacked by free incision, allowing of relief of tension and escape of putrid discharge, the result may be very rapidly fatal to the vitality of the part and of the patient.

Sinus.—Is a track leading from some chronic source of irritation, such as dead bone, cheesy gland or ill managed putrid abscess to the surface. It requires cleanliness and care from nurse and may need operative interference by the surgeon.

Ulceration.—The next stage of the inflammatory process we come to is ulceration. So far as we have

described the inflammatory process we have not necessarily had any destruction of tissue, for a long-continued suppuration may not leave any permanent loss of substance. Ulceration and gangrene, however, imply loss of tissue and they differ from each other only in degree. Ulceration is defined as a molecular death, a loss of substance in fragments invisible to the naked eye, while gangrene is the same form of death detaching visible fragments, varying from the tiny slough in the center of a boil up to a whole limb in which the artery has been occluded.

A simile may explain this. Every wave and every tide are surely and slowly wearing away the chalk cliffs on the south coast of England in unnoticed, because almost invisible, detritus—that is ulceration. A great gale comes with a spring tide and carries off tons of cliff, with a house or two, or a church—that is gangrene.

Causes.—

1. Predisposing, quantity and quality of the blood, together with the freedom and rapidity of the circulation.

2. Exciting, irritation, physical or chemical.

Pathology of Ulceration. — As for abscess: from overcrowding the tissues, and effused matter about the focus of inflammation perish, the peripheral areas become vascularized and are converted to granulations (capillary loops about which are clustered leucocytes, held together by a slight amount of intercellular material).

Simple or Healthy Ulcer.—Granulations, healthy, cherry-red, small, uniform, not painful; discharge, laudable pus in small quantity. If the ulcer has been

treated antiseptically the discharge is serum. Shape, oval and regular. Edges, gently sloping, moderately indurated, showing the blue line of beginning granulation. Surrounding skin, soft, flexible.

Treatment of Simple Ulcer. — In the forming stage: Abort or limit by rest, elevation, local depletion and cold, at the same time treating the rather high constitutional symptoms by withholding food, giving abundance of water, iced drinks or cracked ice. The bowels are kept well open, and if necessary the surgeon orders morphia administered hypodermically to control the pain.

When disintegration is evident: Hasten the separation of the dead from the living tissues by warm antiseptic poultices (sponges, lint or gauze soaked in weak bichloride solution, 1:6000, and covered in by waxed paper and a bandage). Milk diet.

When the dead part is separated, leaving a surface of healthy granulations: Cleanse with sterilized salt solution, 5 per cent. or very weak, and antiseptic lotions, bichloride 1: 10000. Cover with protective or gutta-percha tissue and apply a light antiseptic dressing, finishing with moderately firm pressure by a roller bandage. Full diet. A healthy ulcer heals kindly under nearly any dressing.

Various are the names and treatment of ulcers, but the above is a very fair description, from which nearly all other classes arise, whose treatment and diagnosis being so complicated and difficult it would be out of place to attempt to describe and insert in this book.

Skin Grafting.—By skin grafting is meant the placing on granulating surfaces of healthy epidermis, for the purpose of hastening cicatrization and pre-

venting subsequent contractions. It is chiefly applicable whe.e the granulating surface is large or conspicuously placed or slow in healing. The granulations must be healthy, discharging very slightly, and preferably aseptic. This may be accomplished by washing with weak bichloride solutions and dressing antiseptically for several days before the operation. The area from which the grafts are taken should be thoroughly washed with soap, water and bichloride, 1:1000, followed by 5 per cent. sterilized salt solution (sodium chloride 5 parts, water 95 parts; boil for one hour). The surgeon, by means of a scalpel, scissors or a razor, removes small or large pieces of cuticle and places them, fresh surface down, on the granulations, from which all antiseptics have previously been washed by liberal salt solution irrigations. Antiseptic dressings covered with tight roller bandage. The grafts should be taken from young, healthful persons.

Gangrene.—This is the next and final stage in the inflammatory process. It is a visible death, as distinguished from the molecular death which we have described in ulceration. Gangrene is divided into two divisions—moist and dry.

1. **Moist.**—In this form, as the name implies, the dead part has died suddenly with all its fluids or juices still in it, and as a consequence its putrefaction is rapid; and as the putrefaction can easily spread to system by the veins and lymphatics the danger of systematic infection, blood poisoning and pyæmia is very great and immediate. The causes of moist gangrene are either severe local injuries which have destroyed or impaired the blood supply of the part or limb, or some disease which has affected from the center either

the blood supply or the nerve supply of the part in a sudden manner and with completeness of result. Description: A limb has been badly crushed, we will say, without any external wound, but the large vein has been torn across and blood effused into the tissues, causing swelling at the part and great tension. Pain at first is probably severe, especially at the seat of injury and tension. This, however, gradually diminishes till at last it is entirely gone, and even common sensation in the skin of the more distant parts of the limb is lost. The limb is of a dark, livid color, which at first closely resembles the color of a bruise and may be mistaken for it; but the discoloration spreads rapidly up and soon changes into shades of brown, olive, or, in warm weather, even of dark green. At the same time bullæ or little blisters appear here and there on the surface, separating the cuticle from the true skin. In an ordinary bruise the blisters are full of blood serum, often dark with blood, and are stationary—that is, you cannot move them. You may break them, letting out the fluid, but they do not run together. In gangrene the bullæ contain air as well as serum; that means they are products of early decomposition, and also you can easily make them join each other, like drops of water on a pane, by pressing them along under the sodden, separable cuticle.

With these symptoms—coldness, want of sensation and bullæ—you will be able to recognize early a case of gangrene. and it is of vast importance that you should, for in a simple fracture it may come on, and every hour is of value; for once a limb is in the state we have described early and high amputation is the only chance for the patient, for it will spread with

great rapidity, involving part after part. By this time the circulation is really almost, if not altogether, stopped, the arteries of the limb are no longer pulsating or pulsate very faintly, while in a bruised limb, however sadly swollen and tight it is, you can always feel the pulse and the patient will always tell you how it throbs.

Treatment.—Many a limb has become gangrenous from too tight bandaging, too careful splinting, and this a good nurse will watch and prevent and will always inform the doctor as soon as possible. If during an accident you find an injured limb which you think is bad you may save time and prepare for the doctor by removing every constricting bandage or button and laying the limb in the easiest possible position, covered by some light and not tight non-conductor—best of all is cotton wadding or soft tow—so as to maintain an equable heat without any sudden change of temperature. By such care you may save a limb or a life. The surgeon has to come in in all cases of moist gangrene with his knife—early and free removal above the cause. If he went too low he operates through tissues of lost or low vitality, which cannot stand the extra stimulus of the knife and loss of blood, and the flaps slough and the gangrene spreads.

Dry or Senile Gangrene.—In this the limb dies because it dries—because, for some reason or other, its nutrition has been so interfered with that, beginning at a finger or a toe, the gradual shrinking and drying of the parts spreads slowly upwards. Its most common causation is a disease of the blood vessels which by thickening their walls and impairing their elasticity, narrows their lumen or capacity as tubes. This grad-

ually impairs the vitality of the more distant parts, such as fingers and toes. This is indicated in coldness, blueness of color and stagnant condition of the blood in the capillaries.

Treatment (Diet).—Milk diet, as non-stimulating as possible, while still nourishing; and wine and spirits are forbidden.

(Local).—You are to put two chief objects before your eyes: 1. To avoid any sudden alteration of temperature, and all injuries, however trifling. 2. To keep the part, especially where and when nature's line of demarcation is going on, as sweet as possible. If these two conditions are attained it is extraordinary how little constitutional inconvenience is sometimes caused, even by an extensive senile gangrene, and how little annoyance the dead part often gives. All kinds of poultices, wet dressings, ointments and the like must be avoided, as implying exposure and change of temperature.

Hospital Gangrene. — An epidemic, contagious, gangrenous process, dependent upon the presence of micro-organisms which destroy granulations, attack the tissue lying about and beneath them and rapidly produce extensive sloughs.

Symptoms.—The symptoms are the same as in acute or dry gangrene. The surface of a wound, or its margins, are rapidly converted into an extensive slough, there is surrounding œdema and congestion, the discharge is foul, the process rapidly extends. The constitutional symptoms are adynamic, high temperature at first, with weak, quick, irregular pulse, wet surface and frequently muttering delerium.

Causes.—Overcrowding, deficient ventilation, want of proper nourishment or any depressing cause.

Treatment. — Isolate the patient. The surgeon breaks up the sloughs by thrusting closed dressing forceps through them and withdrawing the forceps opened. In these openings he makes a thorough application of pure bromine, nitric acid or other escharotic. Dress with antiseptic charcoal poultice and subsequently observe the most rigid asepsis in regard to wound treatment.

Diet.—Free, full diet, stimulants, etc.

PYÆMIA AND SEPTICÆMIA.

Pyæmia (Pus in Blood).—A septic fever, characterized by the formation of metastic abscesses. Pathogenic organisms (staphylococci and streptococci) invade the blood and are carried from the infected area to all parts of the body, where they are lodged as emboli and form new foci of suppuration and infection.

Symptoms.—Irregularly recurring attacks, characterized by a marked and prolonged chill, associated with high temperature (104°-106°), followed by a brief hot stage, the patient manifesting the symptoms and signs of fever, terminating in a drenching sweat, the temperature quickly falling to normal or below. Several such attacks may occur in a day. The strength rapidly fails, the pulse beccmes weak and rapid, the tongue dry and brown coated, breath mawkish, metastatic abscesses are detected in the lungs, the wound is unhealthy, the discharge is ichorous.

Treatment.—Thoroughly cleanse the original source of infection by irrigation, curetting and antiseptic

dressing. If this be impracticable, as in osteomylitis, the surgeon usually amputates. All accessible abscesses will be opened and drained. Stimulants are pushed to their fullest extent. Give milk and pressed beef juice in small quantities, frequently repeated. Provide for sunlight by keeping bed in sunny spot and allow free ventilation.

Septicæmia.—A septic intoxication, caused by the absorption of the products of putrefaction. Hence it is most likely to occur in wounds not treated antiseptically or in those which, from their depth, extent or location, cannot be thoroughly disinfected and protected. Instance: Compound fractures, wounds involving the peritoneum.

Symptoms.—The difference between pyæmia and septicæmia is simply a difference of degree. They depend on the same cause and are of the same nature. They occur only in infected wounds and are due to the septic action of micro-organisms and their products.

Treatment.—Secure plenty of fresh air and sunlight. Support the strength by nutritious food, given frequently in small quantities—milk and malt, peptonoids, raw beef juice, stimulants, etc.

WOUNDS.

The Germ Theory of Putrefaction.—Putrefaction is the result of the growth of micro-organisms in the substance which putrefies.

Micro-Organisms.—These micro organisms are divided into:

1. Non-pathogenic, or those which do not directly create disease.

2. Pathogenic or disease creating.

Non-Pathogenic. — Among the non-pathogenic are included those which can live or grow only in dead or dying matter, termed saphrophytic. These saphrophytic micro organisms, entering a wound in which there is much pent-up discharge and dying tissue, rapidly increase and produce certain irritating substances, called ptomaines. The absorption of ptomaines into the system gives rise to the symptoms which are characterized as septic intoxication, ptomaine fever, sapræmia or septicœmia.

Pathogenic.—Pathogenic micro-organisms thrive not only on dead matter, but invade and destroy the living tissues. They may be carried through the circulation to all parts of the body, increasing with incredible rapidity wherever deposited, destroying tissue and forming fresh centers for the production of poisonous products. They enter the system by a process of direct inoculation through wounds. Nearly all pathogenic microbes are either micrococci (spherical) or baccilli (rod-shaped).

The General Principles of Antiseptic Treatment.—1. Prevent putrefaction. 2. If it has already occurred, stop its further progress. Since putrefaction depends upon the presence of an organism and a soil in which it can grow, the indications for the prevention of this process are:

1. Exclude all organisms from the wound. This may be accomplished by most minute attention to the details of surgical cleanliness.

2. Remove organisms from the wound, before they can work harm, by irrigation.

3. Destroy organisms by bichloride or other germicides.

4. Remove the soil in which organisms can flourish by free drainage.

5. Prevent the formation of favorable soil by avoiding tension or unnecessary manipulation and by careful dry dressing.

Difference between Antiseptic and Aseptic.—Aseptic means germ free; antiseptic means germ destroying. The surgeon who does not practice antisepsis cannot procure asepsis. An aseptic wound is the result of antiseptic treatment. Dressings sterilized by heat have undergone as thorough antiseptic treatment as those saturated with bichloride. By an aseptic dressing is meant the application of substances previously sterilized, but containing at the time of application no germ destroying agents. Antiseptic dressings contain germ destroying agents.

Definition of Wounds.—A solution of continuity in the soft parts, produced by some mechanical agents. Wounds present innumerable differences as regards their situation, the parts interested, their direction, size, shape, the nature of the instrument or agent by which they are produced, their more or less simple or complex character, duration, etc.

Varieties. — The different kinds of open wounds are:

1. Incised, or clean cut.
2. Lacerated, or torn.
3. Contused, or bruised.
4. Punctured, or pierced.
5. Gunshot, or lacerated and contused.
6. Poisoned.

The Healing of Wounds.—Repair takes place in all wounds by the organization of plastic lymph. If the wound is an incised one, if its surfaces are accurately approximated, if it is not subject to irritation, either mechanical or chemical, the exudation takes place in minimum quantity, the red corpuscles of the blood clot are absorbed; in 24 hours the surfaces adhere and in two or three days the thin layer of plastic lymph which binds them together is supplied with vessels.

Union by Adhesion or First Intention.—This is called union by adhesion or by first intention. Inflammation scarcely passes the first stage; there is simply a little hyperæmia, puffiness and tenderness about the lips of the wound.

If the wound surfaces are not accurately apposed, if they are subject to irritation, either mechanical, from improper dressing, or chemical, from irritating applications or the products of germ life, the exudation becomes excessive, there is a death of tissue, there is suppuration. If tension and other sources of irritation be removed by free discharge, the gap is promptly filled in with organized plastic lymph or granulations, and the wound heals by granulation or second intention.

If healthy granulating surfaces can be brought together and retained in position permanent adhesion between them takes place at once. This constitutes union by secondary adhesion or third intention.

Primary Adhesion or First Intention. — The prompt union of divided surfaces without obvious signs of inflammation.

Adhesion by Granulation or Second Intention.—The union of divided surfaces by granulation tissue (organized lymph), attended with evident inflammatory symptoms.

Secondary Adhesion or Third Intention.—The union of granulating surfaces. Amputation flaps which fail to unite by primary intention heal in this way.

Preventatives of Healing by Primary Intention.—The circumstances which prevent wounds from healing by primary intention are:

1. Want of accurate apposition, from gaping, from extensive loss of substance, from retained blood or wound secretions or from foreign body.

2. Want of proper protection. There may be undue motion of the part, it may be subject to direct mechanical or chemical violence, it may be exposed to infection from poisonous agents.

3. Defective nutrition, either local from bad position or from tension, or general from constitutional weakness.

Physico-Chemical Influence of Drainage and Absorbent Dressings.—The healing of wounds, once apposition has been effected, is favored by dryness, not in the mere literal sense of the term, but as opposed to the accumulation of fluid. In general it may be said that repair and healing, liquefaction and decay of animal .structures, proceed together. Healing is rapid in direct ratio to dryness and compactness of tissue; in inverse ratio to effusion and laxity. This is the key to the physico-chemical influence of drainage in favoring wound healing. The same explanation applies to absorbent dressings; which by carrying off effused fluids as rapidly as they are poured

out keep the wound clean and dry and are in direct measure antiseptic. Moistening and putrefaction, drying and preservation, go together.

Treatment of Wounds. — The indications in the general treatment of wounds are:

1. Arrest hæmorrhages.
2. Cleanse, and remove foreign bodies.
3. Provide for drainage.
4. Bring the wounded surfaces in contact and keep them apposed.
5. Provide for absolute local rest.
6. Prevent putrefaction.

Drainage Tubes, in surgery, are composed generally of India rubber, from 1/8 to 7/8 inch in diameter, perforated with numerous holes and of various lengths. They are especially useful in chronic abscesses and empyæmia, and also in large wounds, such as those made by amputation, and in all cases where there is apt to be a deep accumulation of discharge. They are introduced in such a manner that one end is on a level with or projects above the skin, the other in communication with the seat of discharge, and by allowing that discharge constantly to escape from the external wound they diminish both chemical irritation from putrid accumulation and mechanical irritation from pressure.

BANDAGES AND BANDAGING.

Practical Knowledge Essential. — A thorough knowledge of bandaging is essential for a nurse, and can only be attained by constant practice, never theoretically. The following will be found to include all the bandages and forms of bandaging which will be

required in the practice of your profession and also some points on their uses and abuses. The minute subdivisions and useless complications described in nearly all important works on that subject, have been purposely avoided, If a nurse is fully acquainted with all here described he will find no difficulty in adapting his bandage to any out-of-the-way case which he may be called upon to care for.

Use of Bandages.—Bandages are used to fix dressings in place, to give support, apply pressure or prevent motion. In bandaging there is a twofold purpose to be kept in view, that which regards it while doing, and that which regards it when done. It should be done quickly, without (if possible) giving pain, and with ease and elegance, so that it may be pleasing to the sight.

Form of Bandage.—The form of a bandage should be suitable to the form and affection of the part to which it is applied.

Where to Commence Bandaging.—Do not let the edges of a bandage cross any sore spot, the tender place should be covered by the full width of the bandage, and in applying it always commence at point furthest from heart.

To piece a bandage lay the pieces flat on each other, lapping them an inch or more and basting them together on the four sides.

Care in Application of Bandages.—Too much care cannot be exercised in applying a bandage in each individual case. to estimate how much tension should be used in order to fulfil the object for which it is employed advantageously and prudently. A bandage may be applied tightly, moderately or loosely. These

grades may be readily tried upon one's own person. A tight bandage makes a healthy hand throb. A bandage moderately applied gives the support of a comfortable glove, and a loose bandage is one which may retain a compress resting upon the eye without discomfort.

Tension.—Each additional turn aplied to the same part of a limb increases the tension nearly double. When, therefore, a roller starts at the wrist, passes to the hand and returns to the wrist the latter receives too much tension unless the first wrist turns are made very loosely. The same is true to a less extent when successive turns are made very close together.

Circumference of Part Bandaged. — The greater the circumference the more force must be used. Thus in applying a roller to the lower extremity it is necessary, in order to secure an equal support for the entire limb, that each turn covering a greater circumference should be drawn a little more firmly than the preceding one.

Incomplete Bandaging.—Any bandage which leaves a considerable portion of the distal extremity of a limb uncovered is very liable to induce swelling. If the hand or foot is left uncovered, while the rest of the limb is bandaged, swelling is very likely to occur. Once started, it progresses very rapidly, because it increases the tension of the lower border of the bandage. This, of course, promotes the swelling, and so these active and passive agents react upon each other to the complete strangulation of the limb.

Character of Dressing. — Where a mass of soft, yielding material like cotton or charpie is interposed much more force is necessary to give the requisite ten-

sion than where a thin dressing or none at all is used.

Shrinkage.—Due allowance should always be made for shrinking of the muslin, if it is known or suspected that from any cause it will become wet.

Situation.—Care must be observed when bandages about the chest are applied that respiration shall not be interfered with, particularly if the dressing is completed before the patient has quite recovered from the effects of an anæsthetic.

Removal of Bandages.—To remove a bandage the terminal extremity should be taken up by one hand and passed behind the limb to the other and by this back again in front, the folds of the bandage being gathered together into a bundle as they are transferred from one hand to the other. By a quick succession of these movements the bandage will be rapidly and tidily unwound and will nct be twisted on itself.

The bandages in general use are the roller, single or double, the many tailed and the triangular.

Roller Bandages are strips of muslin, flannel, gauze or donnett, from half an inch to eight inches wide and from three to twelve yards long, evenly and tightly rolled upon themselves. The selvedge and all loose threads must be cut off.

Double Headed.—Is made by rolling a bandage from both ends togards the center; or a very convenient method in an emergency is to baste together the ends of two single rollers.

Many Tailed.—This consists of a piece of muslin torn into strips from each side tc within an inch or two of the center, which is left entire.

Triangular.—The triangular or Esmarch bandage is made by cutting a piece of calico, about 40 inches

square, diagonally into two halves; of the three borders the longest is called the lower and the others the side borders; of the three angles that opposite the lower border is called the point and the others the ends. Though of much use as a temporary bandage on account of its wide application, it is not much used in civil life.

How to Apply a Bandage.—In applying any bandage the nurse should grasp the roll in one hand, and, taking the loose end in the other, apply it to the limb so that the outer surface may be against the skin, by which the roller, as it is being carried around, will lie close to the limb, and the bandaging will be much neater than if applied in the contrary way.

Spiral Bandage.—The nature of a spiral bandage is indicated by its name, and it consists in covering a limb by a series of spiral turns, each overlapping the one below for about one-third of its width. In practice, however, owing to the enlargement of the limbs at the upper part, it is impossible to apply the bandage without making "turns," i. e., folding the bandage upon itself so as better to accomodate the shape of the limb. To make these "turns" neatly is the difficulty which besets the beginner, but if he attends to the following rules a little practice will soon overcome it.

1. A turn should never be made over a prominence of bone, and where possible should be on the outside of a limb.

2. However tightly the bandage may have been drawn before, at the moment of making the turn it should be held quite loosely, when with one movement

of the wrist the required turn may be made and can afterwards be pulled as tight as necessary.

3. In making the turn the hand should be held slightly above the level of the limb and care be taken not to unroll more bandage than is actually required for its performance.

Figure-of-eight Bandage.—The nature of this is also indicated by its name, and, being formed without any turns, its application is easier than that of the other varfety. The spiral is most applicable to the surface of a limb, while the figure-of-eight is peculiarly adapted for the joints. Either may be applied separately, but a combination of the two is best.

To Bandage the Leg.—To fix the bandage firmly (a most important point) a figure-of-eight turn should

Fig. 1.

be made around the ankle, the foot being raised to a convenient height on a stool. If it is desirable to bandage the foot, a few spirals and turns may then be made over it, beginning at the roots of the toes, but if not the bandage should take another figure-of-eight turn at once, overlapping the former by about one-third of its width. This will give the bandage sufficient "spring" up the leg, and the spiral folds may be at once begun, the first two or so being plain, the turns then commencing on the outer side of leg and being continued as high as the bandage goes. In simply bandaging the leg it is usual to leave the heel exposed, but if for any reason it is desirable to cover it this can be

readily done with a few extra turns alternately underneath and at back of heel. Fig. 1.

To Bandage the Ankle.—The method of applying the figure-of-eight bandage to this joint is sufficiently explained in the previous paragraph. Fig. 2.

Fig. 2.

To Bandage the Knee. The figure-of-eight is to be used for this, but its application requires some little care, or it will be found to slip. In order to fix the end, supposing the bandage has not been brought up the leg, it should be laid across immediately below the patella and the bandage be carried round the limb below the knee so as to cross it. The roller is then carried behind the ham to the inner condyle and makes a loop embracing the thigh immediately above the joint and made to overlap the former loop neatly; then around the femur again, but lower than before, so as to make the next loop fit in properly, and so on until the figure is produced, where the original loop round the femur is completely hidden by the folds of the figure-of-eight loops applied over it. Fig. 3.

Fig. 3.

To Bandage the Groin (Spica).—This useful bandage is best applied while the patient stands. The nurse being in front of him, two turns should be made round the thigh on the affected side from within outwards

(Fig4). Then the bandage is to be carried along the lower part of the groin and over any pad or dressing which it may be desired to hold there: then to pass round the pelvis and back over the pubes, crossing the former fold at the groin, and thus completing the figure-of-eight. A series of similar turns, each slightly overlapping the other, may then be carried round in the same way until the part is covered and sufficient compression reduced. The amount of compression in the groin may be easily regulated by increasing or diminishing the size of the pad, to which the bandage may be secured by a couple of stitches or safety pins.

Fig. 4.

To Bandage Both Groins (Double Spica).—Beginning in precisely the same way as in the single spica, the bandage is carried over the right groin, then around the pelvis and brought over to the left groin to form a loop on the left thigh. It is now carried across the abdomen to the right side and encircles the body at the waist, whence it traverses the abdomen again to the right groin, crossing the commencement of the bandage there and passing round the right thigh. A series of turns of this description will effectually cover both groins.

It must be noticed that the turns round the pelvis should be kept strictly below the brim of the pelvis, but that those round the waist will be at the level of the umbillicus. Since the integrity of the bandage

depends very much upon this being fully attended to, it will be also observed that the spicas are begun at the thigh instead of the abdomen, since the limb offers a much finer starting point than the constantly moving abdominal walls.

To Bandage a Stump.—The object of this bandage is not only to confine the necessary dressings, but in addition to support the flaps and counteract the the tendency of the muscles to draw away from the cut extremity of the bone. In order to accomplish these objects the bandages hould be begun at some distance from the stump and be carried around it with moderate tightness from above downwards for a few turns, the right hand then holding the roller beneath the limb, the left is to grasp the part so as to fix the bandage with the tips of the fingers at that point. The roller can now be brought up over the face of the stump and be fixed in front with the thumb, to be taken back again a little to one side of the first fold and again secured with the fingers, and this can be repeated until the stump is sufficiently covered, a few circular turns being made at the last to secure the folds in their proper places; or, if preferred, a circular turn may be made after each fold across the stump, so as to secure it at once and set the left hand more at liberty. Fig. 5.

Fig. 5.

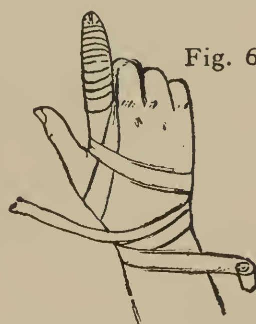


Fig. 6.

To Bandage the Finger.—A bandage three-quuarters of an inch wide will be most ccnvenient, and a

couple of turns (leaving out a loose end) should be made round the wrist. The bandage is then brought back over the back of the hand and taken in in a series of spirals to the tip of the finger, which it surrounds, and is brought back by regular spirals in the opposite direction to the root of the finger again. Crossing the former bandage at the back of the hand, it finally surrounds the wrist and can be finished off by making a knot and bow with the loose end. **Fig. 6.**

To Bandage All the Fingers. — The bandage is carried around the wrist and then spirally over the little finger, as already described; it then passes round the wrist and down to the ring finger and back to the wrist; and so to each finger and the thumb successively as seen in figure. This bandage is used when, in cases of fracture of upper arm, etc., it is thought advisable to bandage the hand to prevent œdema, and is also applicable in cases of wound of the palm. **Fig. 7.**

Fig. 7.

To Bandage the Thumb. — A bandage about three-quarters of an inch wide should be fixed round the wrist by a couple of turns from within outwards, and is then to be brought over the back of the thumb to the lower part of the first phalanx, around which it is to form a loop. Then crossing itself at the phalanx and passing over the back of the hand, the bandage will arrive at the outer side of the wrist, under which

it is to pass to descend upon the thumb and form another loop, slightly overlapping the former one, and so on until the appearance given in figure is produced. The bandage is to be finished off by two or three simple turns round the lower end of the forearm. Fig. 8.

This bandage is very useful in maintaining pressure upon the ball of the thumb in cases of wound attended with smart hæmorrhage.

Fig. 8.

Fig. 9.

To Bandage the Arm.—The bandage is to be fixed by a figure-of eight turn around the metacarpus and wrist, and the bandage may then be commenced as near the fingers as desirable by a series of figure-of-eight turns, passing over the back of the hand, under the wrist and down again over the root of the thumb, then crossing on the back of the hand in regular succession. As soon as the bandage is brought fairly above the wrist a few plain spirals may be applied, and the turns may then be commenced and carried along the outside of the arm. Around the elbow

joint the figure-of-eight turns should be resumed and applied as on knee. If it should be desirable to include the fingers at the same time as the arm. This will be best accomplished first with a small spiral bandage, as shown in figure, and the above can be applied over it. Fig. 9.

Bandage for the Axilla.—The bandage is fixed by a couple of turns round the upper arm from within outwards, and is then brought under the axilla and over the pectorals to the top of the shoulder. It next forms a loop round the root of the neck, and, crossing itself, is brought behind the shoulder to the axilla again. These figure-of-eight turns may be repeated as often as necessary, but it should be remembered that the one first applied is to be the highest of the set.

Bandage for the Head.—The simplest form of bandage for the head consists of a couple of turns round the forehead and occiput, but this is very apt to slip up unless conjoined with a turn under the chin. (Fig. 10.) The circular portion is to be fastened with a pin just in front of the ear, and, the bandage being folded down over it, can be easily carried under the chin and over the vertex. In applying the last turn or two the roll of the bandage is necessarily reversed, as shown in illustration.

Fig. 10.

When dressings are to be kept on the top of the head some of the turns under the jaw should be made first, so that they are kept in place by the circular

ones; or, where it is desirable to avoid the unsightly appearance of the bandage under the chin, the circular portion should be applied and fastened with a pin at the forehead; a turn can then be taken over the head and pinned again at the occiput, and so backwards and forwards two or three times, until part to be completed is entirely covered. A hat or skull-cap when worn will conceal bandage.

When it is advisable to apply pressure to the side of the head (wound of temporal artery) the following modifications of the circular bandage will be advantageous: After a couple of simple turns round the forehead and occiput, the bandage is to be made to ascend and descend alternately as it passes over the point where pressure is to be applied. This arrangement is seen in Fig. 11, and closely resembles the appearance produced by making reversed turns, none of which are, however, made, the bandage being kept flat to the head throughout.

Fig. 11.

Recurrent Bandage for the Head (Capeline).—This bandage is an exceedingly useful one for keeping dressings upon the head or for making pressure upon the integument after extensive scalp wounds. It has the disadvantage of being a little difficult to apply and of being rather hot.

A double-headed roller two inches wide is required, one head being one-third larger than the other. The patient being seated, the nurse stands behind him, and, taking the small roll in the right and the other

in the left hand, applies the intermediate portion of the bandage upon the patient's forehead. It is essential that the commencement of the bandage should be as low on the brow as possible, and the rolls are then brought round the side of the head to as low on the occiput as convenient, for this will vary somewhat with the shape of the individual's head. The bandage in the operator's left hand is now to cross the other and to be transferred to the right hand, while the other bandage is to be folded over it and carried along

Fig. 12.

Fig. 13.

the middle tine of the head with the operator's left hand. The bandage now in the right hand continues its horizontal course around the head to the forehead, where it again crosses the other bandage and passes round to the occiput. The vertical bandage is folded over the horizontal, which keeps it in position, and passes a little to the left side of the middle line, and being again crossed by the horizontal, passes to the occiput on the left, overlapping the former fold in the same direction. This is the point in the application

shown in the illustration, and the hands having just exchanged bandages, are seen passing, the one in a horizontal and the other in a nearly vertical direction. These turns from before backwards, and in the contrary direction, are regularly continued until the whole head is covered, when the horizontal bandage is to make a few extra rounds, so as to keep all tight. The result is seen in figure, where the end of the vertical bandage has been left hanging out to show how it is finally secured by the horizontal turns.

Shawl Cap.—To make the shawl cap for the scalp fold the lower border of a triangular bandage and place it on the forehead with the point hanging down to the nape of the neck; next carry the ends around the head, crossing them behind, and then together on the forehead, and finally turn up the point and pin it to the body of the bandage above.

Fig. 14.

Fig. 15.

Slings for the Arm or Hand.—A sling for the arm is best formed by placing the base of the triangu-

lar bandage beneath the wrist and taking the end of the sling, which passes in front over the shoulder of the affected, to meet its fellow at the back of the neck. The apex of the triangle may either be folded in or brought round the arm and pinned in front, as illustration.

A sling for the hand, when the object is to raise and support the part, is best made by folding the triangle into a broad cravat, which can be then knotted around the neck, so as to give the required height to the hand. In applying this, the end of the sling passing in front of the hand should always go over the opposite shoulder, to meet its fellow at the back of the neck, The reverse method of proceeding does not give nearly so efficient a support to the hand.

Suspensory Bandage.—The ordinary woven suspensory bandage of the instrument makers is convenient enough when the testicle is not enlarged, but if it is the scrotum may be more conveniently supported with a triangle bandage, its base being passed beneath the scrotum, its ends are to be attached to a piece of bandage going around the waist. The apex of the triangle is then brought up in front and fastened to the bandage at the required height.

T Bandage.—Is a simple apparatus for keeping dressings on the perinæium or anus. It is formed of one piece of bandage, to go round the waist, and fastened by tying, or with a button, to the center of which another piece is attached, to pass between the thighs and to be fastened to the circular portion in front. This vertical portion may be conveniently split towards the end, so as to pass on each side of the scrotum, and may be used to keep dressings upon

the groin, if the ends are made to diverge well in front.

SPLINTS.

Splints are surgical appliances used to maintain injured or diseased limbs at rest in accurate position, and to prevent or correct deformities.

Materials.—The materials used for splints are either rigid, such as wood or metal, or are capable of being moulded to the shape of the limb, such as leather, felt or gutta percha.

Wooden Splints.—Wooden splints are made of pine or deal boards, cut to the required shapes and sizes. A very useful material for wooden splints is that known as Gooch's or the "Kettle holder" splint, which consists of strips of wood not quite separated from one another and glued on to oilcloth. It is flexible in one direction and perfectly rigid in the other, so that it is very useful when splints are required to surround a limb.

Metal Splints.—Metal splints are chiefly used for the lower limbs; iron is the metal mainly used, and the splints are made according to a fixed pattern and of various sizes, so that it is only necessary to select one of the proper size and pad it.

If the accurate adjustment to the shape of the limb is required, leather, poroplastic felt, gutta percha, or house flannels soaked in plaster of Paris must be used.

Leather Splints.—A piece of stout sole leather of the required shape and size should be steeped in a trough of cold water for about 48 hours, or until sufficiently softened. The limb should be first bandaged with a flannel roller, and the softened leather applied

and moulded to the limb, and retained in position by a bandage for 24 hours, by which time the splint will have "set" to the required shape. The splint must then be taken off, trimmed and fitted with eyelet holes and laces.

Gutta Percha Splints.—Gutta percha is not porous, and on that account is not so comfortable to wear as felt. It is quite easy to mould, but this requires a little care and experience. The water should not be too hot, or the gutta percha will rapidly lose its shape, particularly if lifted out of water by one end. The water used should be about as hot as the hand can momentarily bear. When sufficiently softened the gutta percha should be lifted out on a towel and plunged for an instant in quite cold water, which will cool it enough to be bearable to the patient. When partially set the splint may be removed to quite cold water, in which it will rapidly set and harden. When moulding the splint the bandage which is used to fix it in position should be wet or it will stick to the softened gutta percha.

Millboard and Starch.—Millboard is not often used as a permanent splint, but in combination with starch bandages it is useful. Strips about four or five inches wide should be thoroughly softened in boiling water, steeped in hot starch solution and then placed lengthwise along the limb outside a flannel or layer of cotton wool and fixed in position with a starch bandage.

Pads.—Splints should be well padded before they are applied. Pads may be made of tow or cotton wool, packed together and wrapped up in soft cotton cloth, for which purpose old sheets, etc., serve very well. Cotton wool alone is objectionable, as it tends to work

into uncomfortable lumps, and, if used, it is well to sew through the pad here and there to prevent the wool shifting. Pads should be a little broader than the splint, so that the edges of the latter are well covered.

Starch Bandage.—The starch is mixed in the ordinary way with warm water, and is to be of the consistency of that used by laundresses. The limb being held in a suitable position by assistants, the old practice is to apply a dry bandage over the whole length of it. The starch is now to be painted with a brush over the bandage and made to soak into its interstices, and any inequalities are to be filled in with cotton wool soaked in the starch. Strips of pasteboard, torn of a suitable size and shape, and well soaked in the starch, are then to be laid along the limb in the positions in which support will be principally required. And lastly, a well-starched bandage is to be applied two or three times over all.

Chalk and Gum Bandage is applied in exactly the same way as the starch bandage. The adhesive mixture is made by adding boiling water to equal parts of gum arabic and precipitated chalk; and this material has the advantages over the starch both of becoming firm sooner and of having more strength.

Plaster of Paris Bandage. — The plaster for this purpose should be the fine white powder used by modelers, and must not be old, or it will have become deteriorated by the absorption of moisture.

There are two ways of applying the bandage.

First Method.—Taking a loosely-woven bandage, dry powder is to rubbed into its meshes on both sides with the palm of the hand, and the bandage is to be

then loosely rolled. These powdered bandages may be kept rolled and always ready if they are preserved in a covered jar, so as to exclude the air. When required the bandage should be placed on end in a basin of water, deep enough to cover it, for a couple of minutes, that it may become thoroughly wetted, and should then be applied as rapidly as may be upon the fractured limb, which must be carefully held by assistants. If the interior of the bandage should not have been sufficiently wetted it can be readily dipped into the basin again, and a little of the fluid plaster applied over all will fill any irregularities.

Second Method.—Some cold water being placed in a basin, the plaster is to be shaken in and the water well stirred until it becomes of the consistency of cream. Then, the bandage being placed in another basin of water, that it may become wetted as it unrolls, the nurse is to commence rolling it in the basin containing the plaster, which will then become effectually applied to its surfaces. The bandage should be applied to the limb, and some of the mixed plaster can be used to fill up the interstices.

Cleanliness.—The day after the application of the bandage, when it has become dry, the surface should be painted with gum water, white of egg, or, what is much cheaper, common flour paste, which will prevent the plaster from chipping; and in children and imbeciles, when the bandage is likely to be wetted with urine, a coat of spirit varnish over the exposed surface of the limb will prevent all damage and materially assist in maintaining cleanliness.

Addition of Salt.—The addition of salt to the water increases the rapidity with which the plaster sets.

Advantages of Plaster Bandages.—The great advantages which the plaster bandage possesses over the starch and gum are the ease with which it can be applied and the rapidity with which it sets, thus forming at once a perfect case for the limb and obviating the necessity for the maintenance of extension during the process of drying. The plaster bandage is readily removed when done with by simply unwinding it, whereas the operation of cutting open the starch is always one of considerable difficulty; or, should the plaster be too thick for this to be accomplished, the dilute hydrochloric acid may be rubbed along one side for a few minutes, when the bandage will become soft enough to cut with scissors. In this way also valvular openings may be made if required.

Paraffine Bandage.—It having been noticed in some cases, especially compound fractures and others involving discharges from wounds, that both plaster of Paris and dextrin or starch bandages have the disadvantages of becoming offensive by absorbing the discharges, in order to obviate this the ordinary paraffine of commerce, applied with a flannel bandage of loose texture, is used. The method which is found most convenient is to have as much paraffine as is thought necessary melted and placed in a china bowl, which is to be immersed in hot water to keep the paraffine in a liquid state. The bandage is to be passed through the melted substance as it is being applied, and as the paraffine melts at from 105° to 120° F., according to its quality, no fear need be entertained as to scalding the patient. After allowing five or ten minutes for the setting of the bandage, two or three coats of the liquid paraffine should be brushed over it,

so as to get a thickness of a fourth or three-eighths of an inch, and, if necessary, another saturated bandage over all.

The advantages for this method are its cheapness, its extreme lightness, its cleanliness, its neat appear- and that it perfectly resists moisture. It is very firm, and if cracked can be mended with a hot wire.

Silica Bandage.—A bandage stiffened with silicate of soda alone, or in combination with lime, in the form of common whitening.

Sand Bags are very useful adjuncts in the treatment of fractures, being laid on each side of the limb, with or without the addition of splints. Care should be taken that the material of which the bag is made is sufficiently fine to prevent the sand from getting out into the bed, and the sand itself should be the finest sea sand and thoroughly dried.

Extension by Strips of Plaster.—A strip of plaster two inches wide is cut long enough to reach from immediately above the knee to the sole and up again on the opposite side of the limb, leaving a loop eight or ten inches long below the foot. This is carefully applied to the limb, a bandage is carried over it, so as to prevent any possibility of its slipping, and a piece of wood or gutta percha may be placed in the loop and across the sole of the foot to prevent its being pressed upon by the plaster; a cord then is fastened to the loop, from which hangs a weight over the foot of the bed, cord running over a pulley.

Application of Splints..—Rules to be observed in the application of splints:

1. Splints should be well padded.
2. They should fit the joints above and below the break.

3. The extremities of the limbs should be left exposed to view (fingers and toes).

FRACTURES.

Fracture.—A fracture is the sudden solution in the continuity of a bone. There are two causes of fracture, predisposing and exciting.

1. **Predisposing.**—

a. Local.—Function, form, position, disease of the bone.

b. Constitutional.—Includes conditions under which the bone becomes fragile or subject to disease or injury, such as age, sex, rickets and necrosis.

2. **Exciting.**—

a. External violence.

b. Muscular action.

The varieties of fracture are:

Incomplete.—The bone is bent, but not entirely broken through.

Complete. — The break involves the entire thickness of the bone.

Simple.—Not accompanied by an open wound leading down to the break; a single, uncomplicated fracture.

Compound.—Accompanied by a wouud leading down to the break.

Single.—Having but one line of fracture, making in the long bones two fragments.

Multiple.—Two or more fractures, the lines of breakage not communicating, if these fractures are of the same bone.

Communicated.—The bone is broken into more than two pieces, the lines of fracture communicating.

Impacted.—One fragment is driven into the other and fixed in that position.

Complicated.—Accompanied by an injury to some other important parts in the same region, as joints, bloodvessels, nerves or muscles.

Fractures about joints are classed as:

Intracapsular.—Within the capsular ligament.

Extracapsular.—Without the capsular ligament.

In young persons epiphyseal separation occurs, especially in the humerus, and constitutes epiphyseal fracture.

The line of fracture is generally oblique, but may be transverse from direct violence, longitudinal when force is applied in the direction of the long axis of the bone, spiral or stellate.

Symptoms.—The symptoms of fractures are.

1. Deformity and displacement, due to, first, the fracturing force; second, the muscular contractility; third, the weight of the part.

2. Abnormal mobility.

3. Crepitus, or harsh grating, both felt and heard on manipulation.

4, Loss of function.

5. Pain and tenderness, sharp and severe.

6. Swelling and ecchymosis, the latter appearing in certain lines.

Treatment.—The general treatment of all fractures:

1. Reduce the fracture by means of extension, etc.
2. Retain it in position by means of splints.
3. Treat inflammation and other complications, either constitutional or local.

Pathology.—There is first free bleeding from the vessels of the injured bone, medulla aud surrounding soft parts. This is followed by inflammation, with exudation, absorption of blood clot and deposit of plastic lymph about the seat of injury; organization completes the process; the plastic lymph is converted first into cartilage, then into bone.

Callus is the plastic lymph which is organized into bone tissue for the repair of fractures.

SPECIAL FRACTURES.

Fractures of the Spine are generally complicated with serious damage to the spinal cord, producing paralysis of the parts below the seat of injury, or, if very high up, causing immediate death by cutting off the nervous supply to the diaphragm. Since time is about the only possible means of cure for these cases, the nurse's care must must be directed to the prevention of bedsores and diseases of the bladder, by placing the patient upon a water-bed from the first and by drawing off the urine at frequent intervals and washing out the bladder at least once a day.

Fractured Pelvis.—The pelvic bones are fractured or displaced generally by crushing violence, and is but too often complicated with rupture of some of the abdominal visecra. The urine passed is generally bloody. In all cases of injury to the pelvis one of the first things to be done is to pass a catheter and empty

the bladder. If the urethra or bladder is lacerated, which may be suspected if the urine drawn off is bloody, the catheter must be retained, and it is advisable to attach an India rubber tube to it in order that the urine may continually drain away into a vessel by the side of the bed. The patient should then be placed on his back, the knees bent and supported on pillows. A broad strip of plaster may be fastened round the pelvis to keep the fractured portions in position, and, absolute rest being necessary, it is advisable to put the patient as quickly as possible upon a fracture bed, so as to avoid all disturbance when the bowels are relieved, etc.

Fractured Lower Jaw.—Care should be taken to examine all the teeth, to see that a tooth has not dropped into the fissure between the broken portions, as sometimes happens, particularly in the molar regions.

A bandage three inches wide and a yard long should have a slit four inches long cut in the center of it, parallel to and an inch from the edge, and the ends of the bandage should be split to within a couple of inches of the former slit, thus forming a four-tailed bandage with a hole in the middle. The central slit can now be adapted to the chin, the narrow portion going in front of the lower lip and the broader beneath the jaw; and the two tails corresponding to the upper part of the bandage are then to be tied around the nape of the neck, while the others are crossed over them and carried over the top of the head, as shown in the illustration.

Fractured Ribs are often very difficult of accurate

diagnosis, especially if the patient is fat; and in cases of doubtful injury to the thorax it is well to apply a broad flannel bandage at once, which generally gives great relief.

When a fracture can be clearly made out the application of a broad piece of plaster, or, better, of straps overlapping one another slightly, from the spine to the sternum of the affected side, is the best treatment, since the movements of the sound side are thereby less interfered with than when the bandage is used.

Emergency Calls.—When you are summoned to a fracture your first care must be to provide against further injury. The patient must be induced to remain as still as possible while preliminaries are arranged. The clothes covering the limb must be removed by cutting along the seams, and the limb must be securely supported by extempore inside and outside splints formed of pieces of board, a strong walking stick, etc., a shawl or thin pillow being used to protect the skin and distribute pressure. The patient must now be placed on a stretcher, or a door covered with spare clothes or straw, the nurse himself taking charge of the limb, while he directs the bystanders how, acting steadily together, to lift the sufferer. The patient should be hand-carried, if this is practicable, as the jarring of any conveyance may do serious injury. He must be lifted to bed with as little disturbance as possible and placed on a narrow bedstead with a form mattress, with a board beneath the latter to keep it flat. A feather bed is quite unsuitable. When surgeon arrives inform him of all you have done, and position in which you found patient, etc.

LUXATIONS OR DISLOCATIONS.

Definition.—These result from force applied in such a way as to dislodge the surface of one bone from another, what is called the head of the bone slipping off into a neighboring depression, the ligaments binding the parts together are torn and stretched beyond the point of slight elasticity found in such tissues, and the adjacent parts are badly contused.

Symptoms.—The cardinal symptoms of luxation are:

1. Change in the shape of the joint.
2. Alteration of the normal anatomical relations of the bony prominences about the joint, the displaced bone being often felt in its abnormal position.
3. Alteration in the length of the limb.
4. Rigidity or restricted motion of the affected joint.
5. Alteration in the direction of the axis of a bone.

Treatment.—Reduce by either manipulation or extension.

1. **Manipulation** consists in so placing and moving the parts that muscles and ligaments are relaxed, articular prominences are disentangled from each other and the head of the bone is either drawn by the muscles or pushed by moderate force into its proper position.

2. **Extension** consists in overcoming resistance by force. This force may be applied by the hands, by wet sheets or bandages fastened about the parts or by multiplying pulleys. When the tension is sufficient to overcome all resistance the bone is pushed into its proper position and is retained in that position by splints and bandages.

Accidents Which May Occur in Reducing Dislocations. — 1. Fracture. 2. Rupture of important muscles. 3. Rupture of principal artery. 4. Ruptured vein.

Responsibility. A nurse should never attempt to reduce a luxation; it is not his province. Try and alleviate the pain by cooling lotions over affected parts; make patient comfortable and prepare for surgeon.

SPRAINS.

Sprain.—The twisting of a joint, by which the soft parts about it are stretched or torn. Muscles, tendons, ligaments, nerves and bloodvessels may be involved.

Symptoms.—Pain and swelling, due to both extravasation of blood and inflammatory effusion within and without the joint; discoloration and loss of function.

Treatment.—Hot fomentations, or hot bath, lasting for several hours, followed by pressure bandage for two to four days; passive motion and massage as soon as the inflammatory symptoms begin to subside, or cold applications and evaporating lotions, followed by pressure and massage.

CRUTCHES.

When a patient begins to move about after any severe operation or accident involving the lower extremities, he has generally to support himself on crutches until he recovers the use of his limb.

Height.—The crutches should be just long enough to enable him to raise the injured leg just off the ground while he stands firmly upon the other. The cross bar should be well padded, so as to form a

cushion upon which he may bear his weight. If this is not done the pressure upon the axillary nerve may be such as to lead to partial paralysis of the arm.

Precaution.—In hospital practice it is always well to wrap a piece of rubber or flannel under the lower end of crutch to prevent it from slipping. This is necessary, for patients are rather awkward when they begin to use a crutch, and if the floor of the ward is waxed or if it has been recently washed they are very apt to fall.

If the state of the limb is such that the patient should not use it at all, it is a good plan to support it with a bandage placed under the foot, the ends being brought up evenly in front and tied behind the neck. In this way a sort of sling is made, which assists the patient in keeping his foot off the ground.

TOPOGRAPHY.

In order to be able to properly control hæmorrhage by pressure it will be necessary to know the position of certain arteries and their relations to contiguous structures, in order that these vessels may be readily found and compressed.

Common Carotid Artery.—This vessel supplies the head with arterial blood; its course from below upwards corresponds to a line drawn from the junction of the collar and breast bones (clavicle and sternum) upward to a point just behind the angle of the lower jaw or between it and the mastoid process of the lower skull.

Where to Apply Pressure.—The pressure should be applied about midway in the neck at the interior border of the sterno-mastoid muscle and directed against

the anterior portion of the spinal column in the neck. The common carotid artery is accompanied by a large vein (internal jugular) and a very important nerve (pneumogastric), which may be injured if the part be roughly manipulated.

Subclavian Artery (Where to apply pressure).—The outer portion of the subclavian artery passes over the upper surface of the first rib. If the thumb is directed downward behind the clavicle about two inches from the breast bone, the artery may be reached and compressed against the first rib. Pushing the shoulder of the patient downward facilitates this procedure. In some persons digital pressure fails to arrest the hæmorrhage, as the artery cannot be reached by the finger. Then the handle of a door key or other suitable agent covered with some soft material to prevent injury to the skin may be substituted.

Axillary Artery.—This vessel is the continuation downward of the subclavian artery. It passes through the axillary space and can not be easily compressed in this situation, consequently the subclavian is generally selected as the artery to which pressure is to be applied in hæmorrhages occurring in the upper part of arm.

Brachial Artery.—Owing to the numerous injuries of the upper extremity the brachial artery requires compression oftener than any other vessel in the body. Its course is along the inner side of the biceps muscle, which is found in the front of the arm and stands out very prominently, particularly in muscular subjects.

Where to Apply Pressure.—Pressure should be

applied at the inner border of the biceps and directed against the humerus.

The Radial and Ulnar Arteries are branches of the brachial and continue down the forearm to the hand. They are superficial at the wrist, the only point at which they can be compressed with any degree of success.

Femoral Artery.—The course of this artery is from the middle of the groin downwards to the inner side of the knee. The artery is superficial in the upper part of the thigh from the groin downwards about six or eight inches, and it is in this situation that the pressure must be applied. It is compressed most effectively where it crosses the pelvic bone at the groin.

Popliteal Artery.—This vessel is the continuation of the femoral artery and is found in the popliteal space behind the bend of the knee and is only slightly affected by digital pressure, although a pad can be placed in the popliteal space and pressed upon the artery by flexing the leg upon the thigh and securing it in this position.

HÆMORRHAGE.

Hæmorrhage is the escape of blood as the result of an injury to a blood vessel and is classified as arterial, venous and capillary.

Arterial Hæmorrhage.—The blood is thrown from the injured vessel in jets or spurts and has a bright red or scarlet color.

Venous Hæmorrhage.—The blood flows from the wound in a slow, steady stream, the color being dark blue or purple.

Capillary Hæmorrhage.—The blood oozes from the general surfaces of the wound and not from one point as in arterial or venous hæmorrhage, the color being dark red.

Natural Means of Arresting Arterial Hæmorrhage.—The natural system of arresting arterial hæmorrhage is as follows: After an artery has been entirely divided its muscular coat produces a contraction and retraction of the vessel at the seat of injury. The contraction diminishes the diameter of the artery, while the retraction draws the ends of the divided artery backward into its sheath. The blood at the mouth of the bleeding vessel forms a coagulum or "clot," which aids in preventing the further escape of blood. Exposure of the bleeding surface to the air, and in severe hæmorrhage the weakened force of the heat and circulation, which often results in syncope or fainting, greatly favors the formation of the clot, and consequently helps to arrest the hæmorrhage. The clot at the mouth of the injured vessel subsequently becomes organized and firmly attached and permanently stops the bleeding. When an artery is only partially divided the contraction and retraction can not properly take place and the hæmorrhage is very persistent. If an artery is severed by a dull or very rough instrument or torn across the fibres at the end, the vessel being ragged and uneven, more effectually close the opening and assist in the formation of a clot and may arrest hæmorrhage in large arteries.

Natural Means of Arresting Venous Hæmorrhage.—The manner in which nature arrests venous hæmorrhage is by the contraction and retraction of the end of the bleeding vessel, with the formation of a

clot, as detailed in arterial hæmorrhage, and also the collapse of the vein at the point of injury. The blood pressure in veins being about one-fourth that of the artery, the hæmorrhage is much less vigorous and more easily controlled.

Natural Means of Arresting Capillary Hæmorrhage.—In capillary hæmorrhage the minute size of the vessels and the contraction that follows their division, together with the rapid formation of a clot, particularly when the bleeding surface is exposed to the air, usually check the hæmorrhage in a very short time.

Hæmorrhagic Diathesis or Bleeders. — In some persons a condition of the blood exists which retards or prevents the formation of a clot. For this reason the most trivial wound may be followed by a hæmorrhage which can not be arrested and terminates fatally. These subjects are known as "bleeders." Cases of this kind are fortunately rare.

Artificial Means.—The artificial means of arresting hæmorrhage are as follows: Position, pressure, cold and heat, torsion, rest, styptics and ligation.

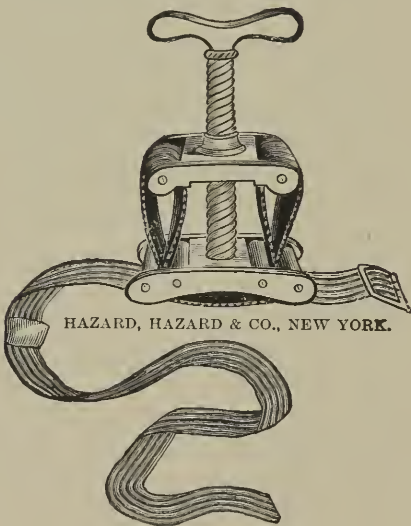
Treatment of Arterial Hæmorrhage (Position).— As arterial blood flows from the heart, it follows that if the injured part be elevated the current of arterial blood in the vicinity of the wound will be impeded and the formation of a clot in the bleeding vessel hastened. **(Pressure).** — This method of arresting hæmorrhage is next to ligation the most important means that can be employed for the purpose. It may be applied directly to the bleeding surface or along the course of the artery. In the latter instance the pressure should be made between the wound and the

heart. In the first variety of pressure (digital pressure) the finger or a pledget or tampon is pressed into the wound and constitutes a valuable means of checking the flow of blood, particularly from small arteries. Pressure with the finger can only be of avail for a short time unless the one making the pressure can be relieved at short intervals. For this reason a tampon if properly applied is more effective than digital pressure, provided the surgeon is not expected for some time or in case it is necessary to move the patient.

Digital Pressure.—In digital pressure the thumb should preferably be used. The function of a pad applied over the course of a bleeding artery is similar to that of a tourniquet, which is an instrument used by surgeons to arrest arterial hæmorrhage by compression.

Extemporized Tourniquet.—An excellent tourniquet can be extemporized by folding a large handkerchief in the form of a cravat, placing between the folds a smooth stone, piece of wood, cork, potato, etc., or a good sized knot may be tied in the handkerchief, which is, however, inferior to the stone, etc. The handkerchief is then bound loosely around the limb and tied, the portion acting as a pad being placed over the artery between the wound and the heart, and held securely in this position, while a bayonet, sword, cane, umbrella, stick of wood, etc., should be passed between the handkerchief and skin at the side of the limb opposite the pad and twisted until the hæmorrhage ceases. As the constriction resulting from this form of pressure interferes with the return of venous circulation, the handkerchief should be occasionally loosened. If there is evidence of serious obstruction,

as swelling and blueness of the part below the constriction, digital pressure should be substituted while the handkerchief is loose.



Spiral Tourniquet.

Cold.—Cold is a very valuable means of controlling venous and capillary hæmorrhage and aids in arresting the bleeding from an artery. It may be applied in the form of cold air (exposure of the bleeding surface), cold water, ice and snow.

Heat.—Hot applications are equally good. A piece of flannel wrung out in water (Fomentation), as hot as can be borne by the skin, and applied directly to the bleeding surface, is followed by a diminution or cessation of hæmorrhage. Both hot and cold applications contract the bleeding vessels and hasten the formation of the clot.

Torsion.—Torsion or twisting is only practiced by surgeons or physicians and should not be attempted by a nurse. It is done by seizing with suitable forceps the exact end of the vessel and twisting it around into a sort of rope, either twisting off the end or leaving it, taking care that it is twisted so far that it will not uncurl again. In healthy, young arteries the method is both easy and safe, but arteries suffering from atheroma are apt to break off short during the process without the bleeding being stopped, and such a failure makes it very difficult to secure the vessel again.

Rest.—Rest is extremely important in all varieties of hæmorrhage, as it favors the formation and retention of the clot.

Styptics.—Styptics, or astringents, although powerful agents for arresting hæmorrhage, are used by surgeons with great reluctance, and only in special cases, or where other means are not available or less effectual. Styptics are objectionable for the reason that the stronger ones, as perchloride of iron (Monsell's solution), nitrate of silver and some others, injure the wounded surfaces and may be followed by sloughing. The weaker styptics, such as tannin, gallic acid, matico, cobwebs and alum, prevent healing by primary union. Alum is the least objectionable of the latter group. The application of styptics to mucous membranes (mouth, nose, etc.,) is followed by more favorable results than when applied to a raw wounded surface.

Ligation.—The method most commonly used by surgeons for the arrest of hæmorrhage from an artery of any size is ligation, as ligature is practically the easiest, safest and most effectual mode of sealing a

vessel. To do it the end of the vessel is caught by a pair of forceps, which have a catch so as to hold on by themselves when once applied. Having caught the vessel, draw it out, and then tie round it near the forceps' end a piece of silk, flax or catgut thread, which secure with a "reef knot," which is a square knot in which both ends of one string pass either over or under the loop made by the other. If the ends are separated by the loop you get what is called a "granny knot," which will slip. The string in the right hand should be held over the other in the first twist and under it in the second, or vice versa. You should practice this knot, which is often called for.

Are there any risks connected with the catgut ligature? you might be tempted to enquire. Yes, there are. One is that it may uncoil itself and cause hæmorrhage by not holding long enough; another that it may be absorbed and give way before the clot is consolidated; but different modes of preparation, now nearly brought to perfection, have made the accidents very rare.

Treatment of Venous Hæmorrhage. — Venous hæmorrhage is easily controlled if the following rules are observed:

1. Remove everything between the wound and the heart that retards the flow of blood, as garters, tight clothing, etc.
2. Elevate the injured part.
3. Apply a good, firm compress directly to the wound.

Constriction of the limb beyond or below the seat of hæmorrhage is valuable, but inferior to the method just described. The importance of first and second

rules will be apparent in rupture of varicose veins in the leg, which often bleed freely, the valves of the disabled veins being rendered useless, the blood escapes from both ends of the divided vessel. In rupture cf varicose veins of the leg a bandage should be applied over the compress, beginning at the toes and extending upward to a short distance above the seat of hæmorrhage. In ordinary venous hæmorrhage the free return of blood to the right side of the heart, aided by elevation of limb, relieves the blood pressure in veins in the immediate vicinity of the wound, and consequently the hæmorrhage is not so profuse.

Treatment of Capillary Hæmorrhage.—Capillary hæmorrhage is usually harmless, except in case of bleeders, and generally ceases when the bleeding surface is exposed to the air. If such means are not successful, hot or cold applications or a compress should be employed.

Treatment of Hæmorrhage from the Mouth.—Hæmorrhage from the mouth may usually be stopped by the use of ice and astringent (alum, tannin) or alcoholic (brandy, whiskey) solutions. If not sufficient, a tampon should be firmly held against the bleeding point. In severe cases the common carotid artery, on the side corresponding to the injury, may be compressed, and only as a last resort.

Treatment of Hæmorrhage from the Teeth.—Severe hæmorrhage following the extraction of a tooth can be controlled by replacing the tooth or the application of a tampon saturated with a strong solution of alum or other astringent to the cavity.

Treatment of Hæmorrhage from the Lips.—The lips are supplied by arteries which divide at the

angles of the mouth and entirely surround the opening. When the lips have been injured the hæmorrhage may be checked by pressing the sides of the wound between the thumb and fingers.

Treatment of Hæmorrhage from the Nose or Epistaxis.—Nose bleed is the most frequent form of internal hæmorrhage, and may be controlled in the following manner: Elevation of the head and arms; removal of all constriction about the neck; cold applications to the back of neck, forehead or bridge of the nose; passing two fingers beneath the upper lip and directing pressure against the base of the nose or nostrils is very useful; sniffing up cold, salt or alum water, or, even better, syringing the nasal cavities with these remedies. If the mouth is kept open during the operation the fluid will escape through the opposite nostril. The well-known practice of dropping a cold door key down the back is not to be despised.

Hæmoptysis (or hæmorrhage from the lungs) is generally recognized by the expectoration of bright red and frothy blood, also coughing and pain and rattling in the chest. The usual cause is disease of the lung, although it may follow a wound of the chest.

Treatment.—Absolute rest in the recumbent position, the head and shoulders slightly elevated; the temperature of the room shovld be cool and the air pure; apply cold externally and internally; let him suck ice in absolute silence, and, as a rule, the bleeding soon stops. Hæmoptysis is rarely followed by a fatal termination, unless it results from a wound of the lung.

Hæmatemisis (or hæmorrhage into the stomach and vomiting of blood) is generally the result of some chronic disease of the stomach, although it may follow

a blow or stab of the abdomen. The symptoms are those of profuse hæmorrhage, also a sense of fullness about the stomach, commonly followed by the vomiting of black or dark blood, which is heavy, not frothy as in hæmoptysis. The vomited matter is mixed with food, provided the hæmorrhage occurs soon after a meal. It should be remembered that the source of the hæmorrhage in hæmatemisis may be from the mouth, nose or throat, the blood having been swallowed. Consequently these parts should be examined.

Treatment.—The usual treatment is rest in the recumbent position, administration of small pieces of ice and the application of ice wrapped in a towel or ice bag; snow, cold water, etc., over the stomach. Hot applications are sometimes employed. No attempt should be made to administer stimulants or medicines by the mouth.

Severe Cases.—In severe cases of hæmoptysis and hæmatemisis the general treatment of shock is called for, particularly the application of warmth to the extremities. Stimulants should be used with caution, as they are apt to encourage the hæmorrhage.

Secondary Hæmorrhage means the reappearance of bleeding in the wounded part soon after it has been once arrested, and may occur when a ligature comes away, from the vessel not having become occcluded, or it may result from sloughing having opened up vessels not previously implicated, but is generally caused by the reaction and increased force of the heart, the relaxation of the blood vessels at the seat of the injury, the immoderate use of stimulants, undue movement of the part and also increased warmth to the surface that follows when the patient is placed in bed. It should

be well borne in mind that secondary hæmorrhage may be followed by collapse and death.

Clots are not to be removed from a wound unless the means of cleaning and dressing the wound are at hand. They act as a temporary compress and hæmostatic.

Caution.—In all cases in which secondary hæmorrhage may possibly occur it is a useful precaution to mark with ink the spot where pressure should be applied, and both the nurse and the patient should know how to make pressure with the finger in case of any sudden emergency. When there is any real probability of hæmorrhage occurring a tourniquet should be kept constantly but loosely applied to the limb, so that it may be put into action at a moment's notice.

TREATMENT OF BED SORES.

Carelessness.—In some very long cases, especially when patients are suffering from paralysis, bed sores can not be altogether avoided, even with constant care and watchfulness, but it is to be feared that they have occurred in the past more frequently than they need, owing to the neglect on the part of those who attended on the sick.

Definition.—Bed sores vary in degree from a slight abrasion of the skin, with a diffused redness around, to large, deep sores, involving all fhe tissues down to the bones. They occur over the prominent points of the patient's body, upon which the weight specially falls as he lies in bed, as over the lower part of the back, the buttocks, the projecting points of the shoulders, etc.

Guarding Against Their Occurrence. — To guard against their occurrence the following rules and precautions should be fully complied with and carried out:

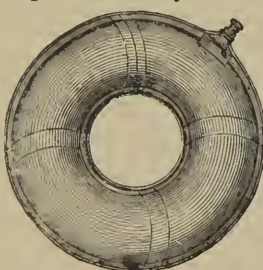
1. The under sheet should be kept smooth and free from wrinkles or crumbs.

2. The patient should be kept as dry as possible, all discharges being cleared away at once.

3. The position of the patient should be varied as frequently as possible.

4. The back should be examined daily and washed with a good alcoholic back wash, and after having been thoroughly dried should be dusted with bismuth, Conway's special or oxide zinc.

5. When any indications of redness appear the patient should be supplied with water or air cushions (as illustration) or the part should be covered with some thick felt or amadon plaster having a circular hole corresponding to the inflamed spot.



6. For bed linen, air dried is better than that which is ironed or mangled, by reason of its greater softness.

Formulæ for Prevention and Cure of Bed Sores.

1. Alcohol, brandy, Eau de Cologne, glycerine, or glycerine cream rubbed over the parts exposed to pressure, after washing morning and evening, serve to harden the place where applied. Alum, ʒss; whites of four eggs; tincture camphoræ, ʒii, is also an excellent preparation for same purpose.

2. Silver nitrate, a solution (gr. xx—ʒi) to be painted

on threatened but unbroken skin, as soon as it becomes red, will prevent sores.

3. To bed sores in the early stage an excellent application is a mixture of equal parts of rectified spirits and white of egg, applied frequently with a feather and renewed as it dries till an albuminous coating is formed.

4. To bed sores occurring in typhoid and other fevers an excellent application is composed of two parts of castor oil and one of balsam of Peru spread on pieces of lint, which are laid on the sore and covered with a linseed poultice, to be changed three or four times a day.

DISEASE.

Disease is a deviation from the normal standard of healthy functions, or from the standard tissue changes. A functional disease is one in which the tissues do not properly perform their function, but in which there is no structural alteration to be found. An organic disease is one in which the functions are not properly performed, owing to structural lesion of the tissues at fault. Every disease has a local anatomical beginning.

Incubation Period.—The incubation period is that time elapsing between exposure to a disease and the manifestation of the first symptoms.

Prodromic Period.—This is the stage of early development of disease, the time elapsing between the incubation period and the full manifestation of diseased action.

Symptoms.—Symptoms are the language of diseased nature, and may be either objective or subjective.

Objective symptoms are such as are evident to the senses of the observer. Subjective symptoms are such as are felt and complained of by the patient.

All diseases terminate in health or death. They may end by:

1. Lysis, a gradual withdrawal of diseased action.
2. Crisis, a sudden change for better or worse.
3. Metastasis, a sudden shifting of the disease.

The first process is most common; the last is rarely seen.

Death.—Death is complete cessation of the bodily functions and of reconstructive tissue change. Death always comes through one of three channels, the heart, the brain or the lungs. It may be due to asthenia, or increasing debility, with depression of the vital function; to anæmia, or an insufficient quantity or quality of the blood; to apnœa, or non-aëration of the blood, and consequently of the tissues; cr to coma, an abolition of the function of the brain.

Cause of Disease.—The causes of diseases may be divided into predisposing and exciting. Predisposing causes may be inherited, or acquired by debilitating influences. Our habits, age, sex, occupation, race and previout diseases all act as predisposing causes. Exciting causes may be food (too little or too much, or of unhealthy quality), drink (impure water or milk or other beverages), heat, cold, noxious substances in the atmosphere (such as chemical poisons or disease germs), barometric changes, different electrical conditions, absence of light, or substances or individuals with whom we come in contact producing infectious or contagious diseases.

Infectious Disease.—An infectious disease is one which is due to a disease germ introduced into the body from without, but not capable of being reproduced in the body; hence not capable of being communicated from one individual to another (*e. g.*, influenza, malaria).

Contagious Disease.—A contagious disease is one that is due to a specific cause, capable of being reproduced in the economy and of being transmitted from the sick to the well (*e. g.*, typhus fever, smallpox). Contagion spreads principally by absolute contact with the poison, and to a slight extent also by atmospheric diffusion. The atmosphere dilutes and weakens the poison.

Sporadic Disease.—A sporadic disease is one which occurs in isolated cases (*e. g.*, rheumatism).

Endemic Disease.—A disease is endemic when a number of cases occur in a limited locality, due to the same cause (*e. g.*, typhoid fever in a limited locality, from drinking water of a contaminated well).

Epidemic Disease.—When a disease is widely spread over a community it is said to be epidemic (*e. g.*, cholera or smallpox). Epidemics are usually contagious or infectious.

Diagnosis.—The discovery of a disease by means of its symptoms is called diagnosis.

Differential Diagnosis.—Differential diagnosis is the art of discovering the disease which is present by a careful comparison of its symptoms with those of other diseases which may closely simulate it.

Prognosis.—Prognosis is the art of foretelling the issue of any disease. It may be general, as the gen-

eral prognosis of typhoid fever; or special, as the special prognosis of any given case.

Treatment.—Treatment is the art of preventing disease, or of taking care of the sick and alleviating their sufferings, or of aiding and hastening their cure.

(**Prophylactic**).—It may be prophylactic when the aim is to prevent the spread of disease.

(**Abortive**).—Where the disease is cut short and prevented running its regular course.

(**Palliative**).—Where it tends to allay suffering.

(**Expectant**).—Where the disease is allowed to run its course, the symptoms being treated as they require it.

(**Restorative**).—Where it aims to build up the constitution and restore to the system such material as may be wanting in the economy.

(**Radical**).—Where a rapid impression is made upon the system and the course of a disease cut short.

General Symptoms.—By general symptomatology is meant the study of such symptoms as pain, the expression of the face, the pulse, the tongue and the temperature, not in connection with any special disease, but with diseased processes generally.

FEVER.

Fever.—The characteristics of fever are:

1. An elevation of temperature.
2. Increased rapidity of tissue changes.
3. As a rule, increased rapidity of the circulation.
4. Alteration in the secretions, which are usually diminished.

Fever Diet.—Fever diet consists in giving the patient plenty of milk, arrowroot or broth; therefore a

light, easily digested fluid diet every two or three hours, day and night. If milk alone is used the patient can take from three to five pints in twenty-four hours.

Fever Treatment. — Fever treatment consists in sponging off the body of the patient under the bed clothes, with cool water, three or four times a day; keeping him lightly covered, the room well ventilated and its temperature from 68° to 70°. He should be given plenty of cooling drinks in small quantities, from fear of overloading his stomach, but frequently repeated, and he should be coaxed to take them. The secretions must be kept up by diuretics, diaphoretics or purgatives, as indicated, and which shall be prescribed by physician.

TABLE OF FEVERS.

Name.	Period of Incubation	Day of Rash.	Character of Rash.	Duration of Illness.	Observations.
Measles......	10–14 days	4th day of fever	Small red dots like flea bites	6 or 10 days	Accompanied with running at eyes and nose.
Ger. measl's or Rotheln.	12–20 days	1st or 2d day	Like me'sl's, with a tendency to become diffused.	5 to 10 days	Sore throat nearly always present, but less serious than in scarlatina.
Relapsing..	Sudden	1st or 2d day	Purpuric spots.	5 to 10 days	Caused by want of food. The special feature of this fever is that a week or fortnight after the first attack, and during convalescence, it is liable to recur two or three times.
Scarl't fev'r	4–6 days	2d day of fever	Bright scarlet, diffused.	8 or 9 days	Very infectious, often accompanied by sore throat, followed by desquamation or falling of the skin.
Typhus......	1–12 days	4th–7th day	Mulberry color, generally over the abdomen.	14–21 days	Very infectious; usually caused by overcrowding and destitution.
Typhoid....	10–14 days or sudden	7th–14th day	Rose color spots few in number appearing in crops.	22–30 days	Seldom infectious; usually caused by bad drainage, accompanied by diarhœa and bloody stools.

TABLE OF FEVERS.—Continued.

Name.	Period of Incubation	Day of Rash.	Character of Rash.	Duration of Illness.	Observations.
Smallpox...	12 days	3d day	Small red pimples, becoming vesicles, then pustules.	14–21 days	Discrete or confluent; great pain in back and intense headache; secondary fever sets in about eleventh day of disease.
Chickenpox	21 days	3d day	Small rose pimples, becoming vesicles.	6–7 days	Not usually serious, but apt to leave scars.
Erysipelas.	3–7 days	2d or 3d day	Diffuse redness and swelling.		Most common in face and head, and after surgical operations or iujuries.

TYPHOID FEVER.

Synonyms.—Enteric fever, gastric fever, nervous fever, enteromesenteric fever, abdominal typhus.

Cause.—The disease is the result of a specific morbid poison, which is reproduced, multiplied and given off as contagia by the stools alone during the course of the illness. The emanations from these excreta may also contaminate the atmosphere, and the excretum may contaminate the water supply.

Special Symptoms.—Temperature is characteristic. Commencing at 99° the first night, it gradually ascends, being about 1° higher each evening than on the preceding evening, but declining nearly a degree in the morning from the temperature of the preceding night. This continues until the evening of the fifth to seventh day of the disease, when the temperature has reached 103°–104°. It then remains stationary, with a slight remission and evening exacerbation, until the thirteenth or fourteenth day, when it begins to decline, coming down every morning 1°, 1½°, or even 2°, but going up again in the evening nearly as high as the night before. This continues until from the twenty-first to the twenty-fifth day, the evening temperature being normal. It occasionally happens (very rarely) in persons who have been subjected to great exhaustion and extreme nervous depression before they contracted the disease that typhoid fever will run its course without any elevation of temperature whatever.

Pulse is small, soft and compressible. It is frequent rather than rapid. Should it be very rapid it would indicate great debility.

Intestinal Symptoms.—Diarrhœa, if not present

from the first, generally comes on by the end of the first week. There are three, four, or often many more, large, fluid and very offensive stools, yellowish or brownish in color, resembling pea soup in consistency.

Eruption.—This is only absent in about 12 per cent. of the cases. When present it is the most strongly diagnostic symptom. It appears from the seventh to the ninth day in the form of a few rose colored, slightly elevated spots, like flea bites, generally on the abdomen, chest or back, sometimes on the limbs, but never on the face.

Morbid Anatomy. — The parts characteristically affected in typhoid fever are the agmenated glands or patches of Peyer in the small intestine, the mesenteric glands and the spleen. Careful study by many observers of Peyer's glands has shown that at first the glands thicken and become elevated from one to three lines above the membrane around them. Sometimes after this a sort of induration occurs; in other instances softening. Later, ulceration affects many, though not all, of the altered glands. And this process may go on until it may perforate all the coats of the intestine. The healing of the ulcers by granulation is the general rule.

Treatment.—Liquid is necessary from the first, oat meal gruel, toast water, rice water, the first three or four days; then milk may be added. Less than half the cases of typhoid fever require alcoholic stimulation at any stage; not more than one-fourth of the cases need it before the middle of the second week, when the fever begins to decline. After that time many require it; first, wine whey, half a wine-glassful about every three hours; later, when weaker, brandy

or whiskey punch—a tablespoonful of whiskey, for instance, every two, three or four hours, with the same or twice as much of milk. Beef tea is indispensable in nearly all cases, from the second week. It may alternate with punch, hour by hour. A patient prostrated with severe typhoid fever should be waked from sleep to take the required nourishment, night and day. Otherwise he will sink for want of it.

Precaution.—The dejections and excreta of typhoid fever patients ought to be at once disinfected, removed from the house and buried in earth. A teaspoonful of crude carbolic acid should be mixed with each motion; and some disinfectant should always be suffered to remain in the bed pan and urinal. Always wash your hands and disinfect them thoroughly after cleaning such patients, as there is great danger of your being infected with the disease if you do not use the greatest care in the cleanliness of your person and clothing from the excreta of typhoid stools.

YELLOW FEVER.

Synonyms.—Bilious malignant fever, typhus icterode, sailor's fever, Mediterranean fever.

Definition.—An acute, infectious, paroxysmal disease.

Symptoms and Course.—With an abrupt beginning, or an indistinct cold stage, with pain in the back or limbs, commencing often in the night, a febrile stage occur of long average duration, sometimes three days without remission; violent cases have it shorter; sometimes lasting only a few days.

The skin at this period is hot and dry, thirst is extreme, the tongue is generally furred, nausea and vom-

iting are common on the second day, with great epigastric tenderness; the bowels are costive; if discharges occur they are very offensive.

A flush of the forehead, with a fiery look of the eyes, is characteristic; delirium is frequently present; violent headache is nearly universal.

When reaction from collapse takes place there follows a secondary fever of very variable duration, and which may terminate in a tedious convalescence, an almost equally prolonged typhoid condition, or death by exhaustion.

Treatment.—No specific has been found for yellow fever. Attention to the stomach is demanded by urgent symptoms. Ice by mouth is refreshing and useful; so is mineral water or iced champagne, a little and often. Lime water, charcoal water and hot coffee have sometimes done service in arresting vomiting. During the hot stage, cold sponging to the face, body and limbs will sometimes promote perspiration better than any other means. Enematas of cold water are sometimes prescribed, but care must be taken not to chill too powerfully. In the collapse stimulation will be needed, by wine, brandy or whiskey, along with concentrated liquid food in small amount, at short intervals. Food should be of the most bland and mucilaginous demulcent description, as irritability of the stomach is the most difficult symptom to contend against.

Precautions for Prevention. — As this disease spreads by human intercourse, merchandise, clothes, etc., care should be taken, first, to destroy all clothing which comes in contact with the disease, or, if it cannot be destroyed, to disinfect it thoroughly and afterwards to boil it. This is better than quarantine.

Second, to disinfect the bodies of the sick, as it appears to be contagious from bodily contact. And third, keeping a strong solution of bichloride in vessels that receive the dejections from patient.

SCARLATINA.

Synonym.—Scarlet fever.

Varieties.—Simple, anginose and malignant.

Symptoms and Course.—After an incubation, supposed to be about five days, after exposure to its cause, lassitude, anorexia, headache and pain in the back and limbs, mark the beginning of the attack. Soon these are followed by fever. On the first day very often the throat is sore, on the second day usually a punctuated red eruption appears on the face and neck, and in ten or twelve hours has covered the whole body. It is of a scarlet or brick red hue, uniformly diffused, with a swollen appearance and a great heat, reaching by the thermometer even 106° Fahr. There is also a sense of burning and some soreness or irritation of the skin. The tongue has a strawberry-like look, the throat is very red and swollen generally with a hue not unlike that of the skin. Fever runs very high, with an extremely rapid pulse, great thirst, headache, perhaps delirium, costiveness, in some cases vomiting. Bad cases may have stupor. By the fifth day mild examples of the disease show already an abatement. Malignant cases may be fatal in a day or two, or even in less than 24 hours.

Desquamation of the skin follows the fading of the eruptions, often large masses of cuticle coming away at once.

Treatment, Mild Cases. — Mild cases usually require no medication at all other than to make sure that the bowels are well opened. For the irritation of the skin connected with the rash, relief is obtained by sponging with cool or tepid water two or three times a day; inunction with glycerine or coco butter is preferred by some. Cold effusion is more troublesome and less safe.

Diet.—The diet in scarlet fever should be as a rule liquid, but need not be low generally in the sense of dilution or exclusion of animal material, unless in the first few days. Sooner than in most diseases the tendency to debility is manifest; then milk, chicken broth, mutton tea or beef tea, etc., will be suitable.

Treatment, Malignant Cases.—Malignant scarlet fever is a disease of terrible depression from the outset. Deficient reaction is one of its characteristics. To promote the external stimulation is primarily important; the hot salt or mustard bath is a powerful agent for this purpose. Urtication, i. e., the direct application of fresh nettles, has been sometimes employed. Mustard plasters are employed energetically, and also hot bottles or bags of hot sand, etc.

Sequelæ.—Of the sequelæ of scarlet fever each has its own indication for treatment. That of dropsy is the most frequently important. If during desquamation the kidneys show any threatening of inaction or suppression, the urine should be watched carefully and tested now and then for albumen. Should it become scanty, smoky or overabundant, it is an indication of danger. The greatest care of the state of the skin must be maintained. It is indeed a good rule of precaution, for fear of some carelessness or exposure, not to allow

a patient recovering from scarlatina to leave his chamber for three or four weeks, at least, from the beginning of the attack, nor the house for four or five. Lemonade as a drink, if the urine is scanty, may be freely used.

Precautions.—To avoid contagion, perfect ventilation must be insured; also the disinfection of all evacuations from the body.

TYPHUS FEVER.

Synonyms.—True typhus, pestilential fever, camp fever, jail fever, ship fever.

Definition.—A specific febrile disease of from ten to twenty-one—usually fourteen—days duration, highly contagious, arising under circumstances of general destitution and overcrowding, and prevailing in more or less extended epidemics.

Causation.—Typhus fever is caused by an infecting principle, communicable from the sick to the well by actual contact, by means of the atmosphere in the immediate neighborhood of the sick, by fomites and by drinking water. This infecting principle is, so far as at present known, invariably derived from a previous case of the disease, and is probably an organized germ. Its prevalence in restricted localities is in proportion to the degree of intercourse between the healthy and the sick. The infecting principle is in all probability borne in the expired air of the patients and in the exhalations from their cutaneous surfaces. It may be thus carried into the atmosphere surrounding them and so reach the blood of those quite near at hand by the channel of the breath or by the saliva which they swallow. If the room occupied by the patient be

spacious, airy and clean, the risk of contagion is very slight.

Symptoms.—The breath of typhus patients conveys and their bodies emit a peculiar, strong, somewhat pungent odor, which has been regarded by many observers as characteristic of the disease. It has been thought that those in whom this fever-odor is strongest are most likely to communicate the disease to others. A chill or chilliness marks the invasion of the disease, which is generally so sudden that the patient or his friends are able to designate the day on which the attack began. At the same time there is fever, which rapidly augments; the skin is hot, the face flushed, the eyes injected; headache is constant and severe, and a feeling of dullness and confusion, with vertigo upon assuming the upright position, and noises in the head, distress the patient. He complains of pain in the back and dull, sore pains in his limbs and joints. Catarrhal symptoms are common, such as slightly hurried respiration, a little cough, sore throat, swelling of the edges of the edges of the eyelids and lachrymation.

Muscular weakness and an extreme sense of prostration appear early. He falls into a drowsy state, but passes uncomfortable, restless nights. Already he requires close watching, especially at night, when in his delirium he may leave his bed and wander from the room.

There is constipation as a rule, but in some instances slight diarrhœa occurs. The abdomen is soft and painless.

The pulse is increased in frequency from the beginning of the attack. It soon reaches the neighborhood

of 110 in the morning, and runs up to 120–130, or even higher, in the evening, with a much higher rate in children. It is full at first, but compressible, rarely firm or tense; it soon grows feeble.

As a rule the temperature rises rapidly, attaining 103°–104° F. by the morning of the third or fourth day, and 104°–105.8° F. the same evening, and remaining nearly stationary at these points until some time in the second week. A decided difference between the morning and evening temperature is more favorable, even when the evening increase is considerable, than a continuously high temperature range in which the morning remission fails.

On the fourth or fifth day the characteristic eruption appears. It consists of numerous roseola-like spots of irregular outline, scattered singly, like the spots of the enteric fever. At first these spots are of a dirty rose color, very slightly raised above the surface of the surrounding skin, and upon pressure they momentarily disappear. Within the course of a day or two they become darker; they are no longer elevated, but appear as faint, dirty, brown stains, and fading, not disappearing, upon pressure.

In abortive cases a favorable termination may take place by critical defervescence at the end of the first or the beginning of the second week.

In average cases the fever comes to an end about the fourteenth day, sometimes as early as the tenth day. The improvement is more or less sudden. The temperature, which in many cases shows a little abatement for some days before the crisis, falls in a single night, or in the course of twenty-four or forty-eight hours, to the normal, or even a little below it. The

eruption fades and gradually disappears, the tongue clears and becomes moist at its edges, the appetite returns.

Treatment.—Hygienic measures relate to ventilation, to cleanliness and to diet. Typhus cases, when treated in hospitals, should be placed in large rooms by themselves, and the windows, even in winter, should be kept open, so as to secure careful and thorough ventilation. All observers insist that bad air is more to be dreaded than cold. When cases are treated at their homes similar regulations are to be observed, and, in particular, all unnecessary furniture and all curtains and hangings which are liable to interfere with ventilation, on the one hand, and to absorb and retain the contagion, on the other, are to be taken away. Quietude is to be observed. Stimulants must be given in cases of great prostration, and if, as will happen in severe cases, the condition of the patient may render it impossible to give the necessary food by mouth, an endeavor to support the patient's strength and to prolong life must be made by means of rectal alimentation and medication.

It is imperative that the patient remain in recumbent position, and the patient should not be allowed to get out of his bed for any purpose. Fatal syncope may result. The management of the patient in delerium will often tax the patience and tact of the nurse to their utmost.

DIPHTHERIA.

Diphtheria is an acute general disease, characterized by a contagious sore throat in which the membrane forms on the tonsils, uvula and back of the fauces

especially, but may form on the skin, in the bladder, stomach and intestines, nares or bronchial mucous membrane. Glandular enlargements also occur, and there is great general depression, out of proportion to the local symptoms.

Cause.—It is due to a special poison, connected probably with bad drainage. It clings to walls, is frightfully contagious, may be communicated by the breath or membrane, and is usually epidemic. It is more intense during cold weather, and may affect any age, but is most common from two to seven years of age.

Prognosis.—The prognosis is always grave, but no case should be despaired of.

Treatment.—Strict isolation should be enforced, as in the contagious fevers. Thorough ventilation should be practiced, and everything coming from the patient should be scrupulously disinfected. Fever diet must be given, the patient being sustained every two hours as in typhoid fever. Free stimulation is usually resorted to, giving alcohol, for its effect on the strength, pulse and mind of the patient. There is great toleration for alcohol in this disease.

Very early in the disease, when the membrane is first forming, the application of strong astringent solutions is resorted to, but after membrane has formed strong applications are injurious. The throat should then be kept disinfected with potassium permanganate or a solution of salicylic acid (7 per cent.) or thymol gr. iv, in glycerine and water. Saturated solutions of pepsin, trypsin or papain are sometimes sprayed into the throat with the view of dissolving the membrane.

Tracheotomy.—Above all other operations tracheot-

omy is the one of haste and emergency, done in hospitals often by the resident surgeon, at any hour, and at a moment's notice. It is an operation of considerable difficulty and great danger in some cases, needing the most careful and efficient nursing if it is to be successful.

Let us suppose, then, you are left as night nurse in special charge of a case of diphtheria. The child is in its little cot or tent, the steam kettle is going; you are on the watch. What symptoms will make you call the doctor? The breathing is labored, the voice is harsh, the cough when it comes clanks and clangs with a brassy, bell-like note—all this you know; but if you see the eyes becoming lustreless and the whites reddish, the lips blue, and, above all, if you see at each breath the ribs lifting and the side of the chest tucked in, then see that the physician is sent for. If he decides on operating, your chief and most important duty will be to hold the child and steady the head and neck. Wrap it up in a sheet, so that by pinning the sheet you can restrain its hands and limbs; bare the little neck to the chest, hold the head absolutely straight, watching the cleft of the chin, in the same line exactly with the upper cleft of the breast bone; and to project the neck forward; if you have not a little round pillow to put behind it, make one of a folded sheet or of your own left arm.

Remember absolute steadiness of your hands and of the patient's neck.

Nursing.—The operation being over, the nursing falls to you under three heads:

1. **The Tube.** — The silver tube is in, both outer and inner; you have to keep the outer firmly fastened,

and yet not too tight to hurt the neck, and you have to take the inner out every few minutes to clean from it the thick mucous and keep the breathing free — a troublesome, tedious task.

2. **The Room.**—It must be kept warm and moist. You must watch your thermometer and your fire and keep it perhaps to 70°, moist; your little kettle must be kept going.

3. **Nourishment.**—You will be told what to give, but you have to give it regularly, gently and cleanly.

Duty to Yourself.—No nurse should think much of self or of self-preservation. That is not our business. Still no unnecessary risks should be run, and in tracheotomy for diphtheria it is right to remind you that you run risks of infection if by any chance the membrane or mucous be blown out of the tube with force and thus enter either mouth or eyes. When the tube is being inserted there is generally a great rush of bloody mucous, most infectious, so keep back your head; it is just the moment when you are apt to put it forward most eagerly; also when cleaning or changing the tube, just keep your face out of the direct line of fire.

Many a good nurse has been off duty for weeks from neglect of such simple precautions.

SMALL-POX.

Synonym.—Variola.

Definition.—An acute epidemic and contagious disease, characterized by sudden and severe fever, which after forty-eight hours is followed by an eruption of pimples on the forehead, face and wrists, gradually passing over the body. This eruption is followed by

a fall of temperature, and in from ten to fourteen days it passes through the stages of vesicle, pustule and crust. It also appcars on certain mucous membranes, and is sometimes complicated with hæmorrhage into the skin and from the mucous surfaces. This disease is the product of a specific and palpable poison, which is reproduced and multiplied during the course of the malady. The poison is a material particle of extremely minute size, contained in the contents of the pustules and the cutaneous and pulmonary excreta of smallpox patients.

Treatment.—The mildest cases, alike with severe ones, require rest in a bed without curtains, in a chamber not above 60° Fahr. and freely ventilated. The bed clothing should be light and the body linen should be daily changed. In severe and long-continued cases the patient's back should be often examined, with the view of preventing sloughing of the skin. The bed clothes should be changed frequently, and any scabs or crusts that can be collected should be burned. Heat of skin should be relieved by cold water sponging and the swelling of the eyelids and other painful parts by the constant application of cold compresses. The hair should be shaven from scalp as soon as possible, so as to prevent matting over the pustules. To relieve itching vaseline may be used; when employed as a dressing to the face it will facilitate the removal of scabs; and to destroy the disagreeable odor some kind of deodrant, such as sanitas powder, should be sprinkled about and over the patient's face and bed. The mouth must be kept scrupulously clean, and the eyes should be carefully watched and any change at once reported. When delirium is marked, it would be well to have

help within call, as mechanical restraint, such as tying down, straight jacket, etc., is strictly avoided. When the crusts begin to form about the nostrils they should be removed, and the patient must remain in bed until suppuration under the crusts has ceased and the skin has healed. Abscesses are opened by physician when they appear, and a water-bed should be procured for patient at same time.

Diet.—Lemonade, tamarinds and such like drinks, cooled with ice, may be taken freely. He must be fed at intervals on easily digestible food, such as milk, beef tea, chicken broth, and eggs beaten up, and occasionally, according to habit, a little wine or spirits is usually ordered by physician to be given.

The patient may be considered convalescent when the crusts and scales have disappeared.

Sequela.—About the eleventh day laryngitis often supervenes, and for this tracheotomy is performed, on account of difficulty of breathing, and though in the majority of cases the patient dies, the relief from suffering is so great that the operation is seldom delayed.

Preventative.—Vaccination is the great preventative of small-pox, and has been rightly made compulsory by law within a certain time after birth, because, in proportion as it is efficiently performed, it greatly modifies the disease, so much so that perfect vaccination is almost absolute security against death from small-pox. It diminishes also the prevalence, extension and force of epidemics of small-pox.

ASTHMA.

Asthma.—Pure asthma is probably a spasm of the bronchial mucous membrane.

Cause.—It is often inherited. In some cases it is due to inhalation of irritant principles. The exciting causes of asthma are bronchitis or an attack of lithæmia.

Symptoms.—The attack is apt to be preceded by digestive disturbances. The urine is loaded with urates, and perhaps some slight dyspnœa occurs, lasting for several days.

The attack itself is ushered in by greatly embarrassed respiration, with loud, wheezing rales, usually expiratory.

The patient experiences great difficulty in breathing, with a sense of oppression in the chest, and calls into play the extraordinary muscles of inspiration, in order to enable him to breathe more freely. After a time there is a profuse expectoration, and gradually the paroxysm subsides, to be repeated again on the ensuing evening or evenings, and finally to pass away entirely.

Prognosis.—The prognosis, as regards life, is favorable, though the underlying causes to which the disease is due, or the affections to which it leads, may cause death. It is a chronic malady.

Treatment (1) **of the Paroxysm.** — The patient should be kept in a moist atmosphere, and counter-irritation, especially by dry cups, applied over the chest. Inhalation of the fumes arising from burning stramonium leaves is of use. Coffee, caffeine or cocoaine are of service, especially in uncomplicated cases, where the nervous element is pronounced. Change of climate exercises a decidedly beneficial effect. Some cases are benefited by inspiring compressed air, and others by inspiring rarefied air.

(2) **The Interval**—An easily-assimilable diet must be selected; in nocturnal asthma the evening meal should be very light. Graduated exercise and frequent bathing, followed by friction of the skin, will add to the general vigor. A change of climate is desirable, but there is no fixed rule in the selection of locality. Many asthmatics do well in the city, but a dry atmosphere and a high altitude are better suited to the majority. Excellent results are claimed from the habitual wearing of an oil-silk jacket in asthma associated with bronchitis.

TUBERCULOSIS.

Definition.—Is an acute or chronic disease, usually the latter, caused by the deposition, softening and breaking down of tubercle in the lungs and the ultimate formation of cavities in those organs, and characterized by progressive wasting of the body, persistent cough, with a profuse expectoration of opaque matter and sometimes of blood, loss of color and strength, shortness of breath, hectic fever, night sweats and diarrhœa.

Acute Tuberculosis is usually called *galloping consumption*, and is an acute disease running a rapid course, which usually terminates in the death of the patient within a very short period. The bacillus tuberculosis is deposited from the blood in the lungs, bowels, brain, etc., and usually produces diffused miliary tuberculosis.

Treatment.—The indications for treatment are to reduce the temperature and hectic, to nourish the

patient and to treat those symptoms which may require it. The patient should, therefore, have a light, easily digested, nourishing diet, but he should not be overfed, as this tends to increase tissue waste.

Chronic Tuberculosis.—It is called tubercular phthisis, tubercular disease of the lung and consumption. The disease consists of three stages, the stage of deposit, the stage of consolidation and the stage of the formation of the cavity. It is strongly hereditary and is predisposed to by a sedentary life. In some instances it is unquestionably due to breathing the emanations of a patient suffering from the disease. The pathological cause is tubercle, which has been mentioned already.

Treatment.—The patient should be warmly clad, but not sufficiently so to produce perspiration. He should be bathed with cold water in the morning, bathing his neck and chest, and undergoing what is called a hardening process. He must have a plain but nourishing diet, and abundance of meat, if it is well digested. If, however, the stomach becomes disordered, he must be placed upon a milk diet, gradually increasing the amount until he is able to take it in large quantities. The extracts of malt, beer, etc., are foods, not medicines, in this disease.

Precautions.—It has been shown by carefully conducted examinations that the most fruitful source of tuberculous infection is to be found in dried phthisical sputum. Experiments have shown that currents of air do not carry bacteria off from fluids or moist surfaces, but when the substances containing the bacilli are dry these organisms are readily transported with

particles of dust in the atmosphere. It has been shown that the violent churning motion of the gases and matter in the cavities of the chest of patient, produced by coughing, ejects into the air little bubbles of tuberculous matter, which cannot fail to be drawn into the lung passages of those around, especially if removed only a foot or two from mouth of sufferer. The best way of guarding against this source of danger is by

Ventilation, so efficient as to keep the air of a room in a constant state of renewal. By this means the infection is made so thin that the danger to the other inmates of a house is rendered very slight. Never allow the patient the use of a handkerchief. Always keep the sputum cup in a state of cleanliness and half full of disinfectant solution. The patient can use small pieces of gauze to wipe his mouth, which after being once used can be burned.

PNEUMONIA.

Definition.—Inflammation of the lungs, that is to say, of the true structure of the lungs, the air vesicles, vessels and the surrounding or investing tissues, which together make up the spongy texture of the lung, is called pneumonia. The disease is accompanied with high fever, difficult breathing, darkness of the countenance, and, after a time, with cough and expectoration. The former is short and hacking and the latter, at first scanty, after twelve or eighteen hours increases in quantity and assumes a tough, tenacious quality, of a rusty color, due to the pres-

ence of the coloring matter of blood. Pneumonia runs a definite course, and, like some fevers, has its critical days, but it is not contagious.

Varieties.—Essentially the disease is one, but various writers upon it speak of it as of different varieties, such as:

(*a*) *Right and Left and Double Pneumonia*, according as the right or left lung, or both lungs, may be effected.

(*b*) *Acute Pneumonia.*—When the disease is running its acute course.

(*c*) *Chronic Pneumonia.*—When the disease is attended with less fever and the symptoms are prolonged.

(*d*) *Lobular Pneumonia.*—When the disease is confined to portions of the lung structure.

(*e*) *Diffuse Pneumonia.*—Called also interstitial pneumonia—when the inflammation involves large portions of the lung structure.

(*f*) *Broncho-Pneumonia.*—When the pneumonia is combined with bronchial inflammation.

(*g*) *Pleuro-Pneumonia.*—Where the disease is combined with inflammation of the pleural membrane.

(*h*) *Secondary Pneumonia.*—When the disease comes on during the existence of other diseases of the body, such as typhoid, typhus, small-pox, measles, erysipelas and pyæmia. In this secondary form it is frequently the immediate cause of death.

Treatment.—The patient should be kept in bed and not allowed to leave it under any circumstances. The room should be large and airy, and the temperature about 60° to 62° Fahr; it should be well ventilated; a plentiful supply of fresh air is most important, but due precautions against a draught must be exercised in the ventilation.

Diet.—The diet should be carefully regulated, nutritious and easily digestible, consisting of milk, milk with the white of egg, beef tea, meat essence, and such like articles, given in varying quantities and at varying intervals, according to the condition of the patient. With the object of promoting the appetite, it is essential to keep the mouth cleansed with equal parts of glycerine, lemon juice and ice water. Small quantities of wine, as hock, dry sherry, champagne or Burgundy, occasionally given with food, are often useful as stimulants to the appetite and digestive process.

Rest and Talking.—Everything should be done to husband the strength of the patient. Perfect rest must be enjoined, and all unnecessary speaking must be prohibited.

Pain in Side and the Cough.—There are two circumstances which often tend greatly to interfere with rest—the pain in the side and the cough. The former of these is usually relieved by flaxseed poultices or fomentations to the side. These must frequently be changed, and great care should be exercised in their renewal not to disturb or inconvenience patient. Cough is not usually a troublesome symptom, and unless it greatly disturbs the patient it is better not to interfere with it.

Chief Source of Danger.—The chief source of danger is failure of cardiac power, and consequently all symptoms of such failure must be carefully watched for. Apnœa is less important, except in those cases where both lungs are extensively involved.

Convalescence.—During the period which immediately succeeds the crisis the utmost care is required

to support the patient and to prevent any serious amount of prostration, which at this time sometimes supervenes. Stimulants are usually required for some days after the temperature has attained the normal standard. Convalescence in most cases is quickly established.

ERYSIPELAS.

Symptoms.—Is a zymotic disease, characterized by a diffuse inflammation of the skin and subcutaneous connective tissue. It may be epidemic or sporadic. When developing itself the skin becomes of a scarlet or light purplish color, tense and shining, and the patient experiences acute, burning, throbbing pain in the part.

Causes.—Erysipelas is occasioned by certain imperfectly understood conditions of the atmosphere, by foul air, improper nourishment, exhaustion, intemperance, etc. Chronic diseases producing marked debility may also prove predisposing causes, as is seen in albuminaria and diabetes. The disease is of frequent occurrence in hospitals, especially in those containing many suppurating wounds, as large military hospitals after a battle. The poison of erysipelas (whatever it may be) is most apt to enter the system by an open wound, as by inoculation. It poisons the blood as in pyæmia, and there is great constitutional disturbance.

Treatment (Local).—The chief objects to be attained by local dressings in erysipelas are relief of pain, exclusion of the atmosphere and the removal of the suspected source of infection. After the part is slightly

elevated, if such be possible, soothing fomentations of about the temperature of the body, which may or may not be medicated, are applied. Among these, when a simple form of the disease is present, may be mentioned lotions of lead water and laudanum or belladonna. Diluted preparations of bromine—forty drops to the ounce of water, with sufficient bromide of potassium to effect solution—and solutions of sulphate of sodium, have been used. In facial erysipelas a mild ointment of oxide zinc may be painted freely over the parts; or the affected surfaces may be treated as a simple burn, and bismuth or oxide zinc powder sprinkled freely over them. Pus is to be evacuated wherever formed.

Treatment (General).—The indications point to rest, cooling drinks and stimulating, nutritious diet, the disinfecting of all evacuations and constant vigilence in guarding against bed sores.

Isolation.—In the epidemic form of erysipelas the patient or patients should be isolated as much as possible.

EPILEPSY.

Attack.—Usually an attack comes on very suddenly, often preceded by a cry of pain or great fright. The patient falls suddenly with great force, sometimes in the most dangerous places. Convulsions then begin. Usually they are first what is termed tonic—that is, the limbs and body become rigid and immovable in certain positions. Then the so-called clonic movements occur—that is, the patient is violently twisted, con-

torted and tossed about. Frequently these movements begin in one limb or part and extend rapidly until all portions of the body are involvd, and the convulsions become general. The face, at first pale, changes to red, gray or purple, or becomes absolutely livid, or alternates between pallor, flushing or lividity. The pupils are dilated and fixed. The eyes are frequently turned upwards. The patient froths at the mouth, ejecting often a mixture of saliva and blood. The tongue is generally bitten early in the seizure. The breathing is irregular and sometimes stertorous. The attacks vary in length, always seeming longer than they are, usually not lasting more than a few minutes at most. As the convulsive movements cease the patient sometimes becomes semi-conscious, but continues much dazed, or more commonly falls into a profound stupor. Sometimes urine is passed unconsciously, or the bowels are involuntarily evacuated. The pulse shows great variations.

Treatment.—It is important not to be too meddlesome. More harm may be done by unnecessary interferance than by comparative neglect. It is important, however, that a person in an epileptic fit should be watched. If the clothing is binding anywhere it should be loosened. The patient should be placed so as to have as little injury as possible result from the violent movement. It is better to have the head slightly elevated. If the room is close, fresh air should be allowed to enter it in abundance. It is not well to roughly seize and hold the patient, or to force open the clenched hands with great effort. It is not always best to make great efforts to open the mouth by means

of a towel or wedge or bandage. The object of this would be to prevent the patient from biting his tongue, and, as this commonly occurs early in the seizure, the mischief will usually have been done before the treatment can be applied. Here, as in so many other cases, no fixed rule applies; but good and quick wit come into play. An epileptic attack cannot be aborted by brute force. If with a patient known to be an epileptic, the nurse should see to it that the patient is never in any unnecessary danger. Clothing should be worn a little loose, and the patient should be guarded from danger from fire or machinery.

Diet.—The diet in cases of epilepsy should be carefully attended to, as epileptics are likely to be large eaters. They seem sometimes to require large amounts of food, but they can easily eat too much. The amount and character of the food will be prescribed by the physician, but to the nurse the carrying out of these directions must necessarily be entrusted. Observations made by some good authorities strongly favor a vegetable diet in epilepsy, and when such diet is ordered the nurse should see that it is rigidly adhered to according to directions. Overloading of the stomach and prolonged constipation sometimes lead to the attacks. These should be prevented.

DELIRIUM TREMENS.

Definition.—Delirium tremens is an affection occuring in persons habitually addicted to the use of alcohol, and particularly seen in those who have been drinking steadily for some time and taking but little

food. It is characterized by sleeplessness, delirium and tremor. Delirium is one of the most prominent symptoms of the morbid state, which is otherwise characterized by hallucinations, dread, tremors of the tendons and muscles of the hands and limbs, wakefulness, absence of sleep, great frequency of pulse. A thick, creamy fur loads the tongue, and a cool, humid or perspiring surface prevails, while the patient gives forth a peculiar odor of a sacchro-alcoholic description, more or less strong. It has been determined by direct experiment that alcohol is absorbed directly into the circulation and is capable of acting as a direct poison upon the nervous tissue through which the poisoned blood circulates. Its odor can be easily detected in the breath. This odor is generally well expressed in cases of delirium tremens.

The essential nature of delirium tremens is associated with the loss of cerebral power, evinced especially in the want of control over thoughts, emotions and muscular action, consequent on the direct influence of the alcoholic poison. Disturbances of function, depression and debility are the attendant phenomena. The feeble but rapid action of the heart, the tremulous, undecided action of the muscles and the terror-stricken and agitated mental state betoken the depressed condition of all the living functions.

Treatment.—The indications are: 1. The elimination of the alcohol. 2. The sustenance of the patient during this period. The strength must be supported by diet of the most nutritious kind, in a fluid and mild form, such as yolk of eggs, soups and the like. Food should be given in small quantities and often.

Beef tea, soup and egg flip, spiced with cayenne pepper or capsicum, are each to be commended at different periods of the day. Full precautions must be taken so that the patient does not catch cold, and if he continues to digest food the danger is much diminished. The danger in the first instance is from exhaustion; and careful nursing is above all things necessary, so that protection may be adequate and the food adapted to the state of the digestton, which is always feeble. The disease must be treated as one spontaneously curable; not by withholding remedies, but by using them in strict subordination to good nursing in a darkened room, with carefully adjusted diet and regimen.

NURSING OF THE INSANE.

Before proceeding to state the general measures to be adopted in the treatment of the truly insane, it will be appropriate to refer to two conditions of mental and nervous derangement which are not too infrequently met with, and by their peculiar manifestations are apt to mislead the nurse in his judgement of the importance of various symptoms, namely, hypochondriasis and hysteria.

Hypochondriasis more often arises from mental than bodily causes. Social conditions in a great degree tend to increase the number of cases dependent on mental causes, for we often find hypochondriasis developed as the result of ungratified ambition, unfortunate speculations and after long-continued mental application, with sedentary habits. But males in all

grades of society, from the highest to the lowest, who are accustomed by occupation or mode of life to confinement and lack of exercise, are liable to be subjects of this condition, or rather disease. Occasionally it seems traceable to derangements of digestion from indulgence in indigestible food or dyspepsia. Whatever be the cause, medical advice is called for, but the treatment will often be ineffectual unless the friends of the patient, and especially the nurse, if employed, assist in dispelling the illusions.

These illusions are often manifold, and the disease sometimes appear to border on insanity. Nevertheless, there are essential differences in the two conditions, which it is important the nurse should know. The hypochondriac does not believe in the reality of his illusions, all his thoughts and actions are connected with the state of his bodily ailment, and he fears death. On the other hand, the insane patient believes in the actuality of all illusions, upon which all his thoughts are concentrated. If he is melancholic he establishes a connection between all occurences and his own condition, and the future appears dark and fraught with danger. Instead of dreading death, he desires and often seeks its quicker advent, and suicide is the result. When hypochondriasis extends beyond certain limits, when the patient begins to believe in the verity of his own illusions, then the disease has altered its character, has become insanity, and the treatmeut is different. This transition, however, is of rare occurrence.

Treatment of Hypochondriasis.—The most important point to be gained is to divert the patient's

thought from himself and constantly to direct his attention to other matters. When circumstances do not permit travel, etc, or the patient is unable to leave the room, the body should be sponged with cold water and rubbed with a flesh brush twice daily, exercise indulged in as much as possible and the mind be agreeably occupied. The patient should retire to bed early, not sleep too long and arise early and immediatety after awakening. He should never be left without some employment, and be persuaded to leave the sick room.

Hysteria.—Hypochondriasis in the male finds its counterpart in the female as hysteria. Although especially occurring in the latter sex, male subjects in exceptional instances present symptoms almost identical. In both sexes it is a disease dependent on derangements of the brain and nervous system.

Insane.—In the treatment of the insane, in such cases as offer hopes of ultimate recovery, as well as those which are incurable, the importance of philanthropic measures is now universally recognized. All endeavors of the physician will come to naught if the patient is exposed to the whims and passions of a rude and inconsiderate nurse. The relations or friends are usually least adapted to nurse the patient, because the latter is often suspicious of them and often looks upon former friends as enemies, pays no attention to their advice or directions and by conversing with them is inclined to outbursts of passion which aggravate the disease.

Nurse.—The nurses of insane patients should be firm in their behavior, but not harsh or unfeeling.

They should have discretion enough to guard against refering to anything which has caused the insanity; nor should they encourage the belief of the patient in his imaginary rank in society, etc., nor flatter him. To enter into discussions with the patient and attempt to convince him by reasoning that he is deluded is not only useless but often very dangerous. Opposition, contradiction, reasons, give rise to irritation and provoke hate. The nurse must therefore have sufficient self-control to endure much bad behavior and insulting language. Strength, courage and decision are further requirements of advantage in controlling delirious patients, but in no case is the nurse permitted to punish the patient by either word or deed, not even when he has recourse to violence.

Means of Control. — Means of control, such as straight-jackets, straps, etc., are only to be applied by the physician's orders. In only one instance does this rule admit of an exception, namely, when in sudden delirium there is imminent danger that the patient will injure himself or inflict harm upon his surroundings.

Weapons.—The nurse should remove every article which the patient might use with such intentions. Hence all cutting or piercing instruments, cords or ropes, or easily imaginable substances are to be kept out of the patient's reach. An insane person should never have money about him. If found, it should be ascertained how he came by it and the physician should be so informed. The nurse should never accept a gift from an insane patient, as in .the eyes of the law he is looked upon as a minor, not having the right to transfer any money or property.

Asylums.—In asylums the nurse should prevent insane patients from asking visitors for money or giving them letters. Visits, especially from relatives, should never be allowed without the physician's permission, because they are apt to remind the patient of former occurrences having connection with the cause of the insanity. A relapse may be the consequence, and the recovery of the patient made more difficult. Letters written by insane patients or directed to them from friends should never be delivered without the special consent of the physician.

The behavior of the patient and the symptoms of his insanity must be closely observed by the nurse, and every bodily ailment immediately reported to the physician. In such cases which are characterized by epileptic convulsions the exact time of their occurence must be be noted. Patients who are inclined to commit suicide often seek with great cunningness to elude observation and to conceal their plans; they must therefore at no time be left alone. But the nurses appointed to watch and prevent the patient from accomplishing his object must not let him become aware of the supervision, lest he may consider himself imprisoned. Insane patients whose disease manifests itself by indulgence in bad habits require special observation and employment in order to distract the mind, also to prevent them from setting a bad example to others. The patient should only be allowed to leave the ward at stated times. When the nurse observes that the patient shows little inclinarion towards one employment given him and more towards another, the physician should be so informed. The disposition of

each patient, whether towards work, idleness or resistance, is also to be reported. Patients who have been placed under control in separate rooms, straight-jackets, etc., call for special observation, and the physician must be informed as soon as their condition or behavior seems to demand delivery from confinement. Strict order and cleanliness must be enforced.

Starvation.—Patients who have determined to die by starvation must be observed during meal times, to see whether they really partake of food. Articles of nourishment which require cutting, such as bread and meat, must not be eaten too rapidly by insane patients, to avoid the danger of suffocation by morsels remaining in the pharynx or æsophagus.

Medicines.—Insane patients must never be allowed to touch medicines themselves, to prevent their throwing them away or taking an overdose. Drinking cups, etc., must be of metal. When the patient refuses to take medicine, further action is subject to the physician's direction. In other respects the rules laid down for nursing in other diseases likewise apply to that of insane patients.

PURIFICATION OF AN INFECTED ROOM.

How to Purify Room.—After a sick room has been occupied by an infected person, it should be purified as follows:

1. Let everything that can be done be done within the room itself.

2. Make a large fire, close the door very completely and open the windows widely, or even take out the

sashes altogether, and cleanse them and their framework thoroughly.

3. Put on the fire everything that admits of being instantly destroyed.

4. Pack up closely and carefully every article of clothing and bedding that is to be conveyed away for disinfection by heat. A light iron trunk, such as is commonly employed for traveling by sea, is the best for packing up infected garments. If the clothing is to be cleaned by washing, it should be dipped into cold water and carefully wrung out and packed while damp in the above-named air-tight trunk. By this means the spread of infection during transit to the laundress is prevented.

Instructions to Laundress.—The laundress should be instructed to plunge the clothes into boiling water, and after boiling them for fifteen minutes to cover them closely until cold. The garments may then be washed in the ordinary way.

5. **Walls and Ceiling.**—Cleanse the walls and ceiling of the infected room; strip off the wall paper and treat with two coats of distemper; brush the floor and woodwork free from dust, and burn the dust; then wash the floor thoroughly all over with a solution of oxychlorine (one part to forty of water), finishing with clean water.

To make all sure, make room air-tight and diffuse iodine vapor or sulphurous acid gas through the apartment.

The room may then be considered effectually disinfected, and after a second airing is fit for use.

MODES OF DEATH IN DISEASE.

The mode by which disease (acute and chronic) terminates fatally vary so much that careful observation is required in order that the management of any disease may not be such as to favor any of these natural modes of death, but rather such as to ward them off, thwart them and promote natural modes of recovery. For in constitutions which are unimpaired there may be always recognized a tendency to a spontaneous favorable termination of diseases. To foster this tendency is the aim of all efforts to cure diseases.

Death may happen from decay of life, as in old age, but the life of man may terminate by various modes of dying—death beginning at the heart, the brain or the lungs.

Death by Syncope, as when the heart's action ceases from loss of blood, or decline of aortic pressure, is indicated by paleness of the lips, countenance and surface of the body; cold sweats, dimness of vision, dilated pupils, vertigo, a slow, weak, irregular pulse and speedy insensibility. Sudden and excessive loss of blood is attended by nausea or even vomiting, restlessness, tossing about of the arms, irregular sighing, breathing (anxietas), delirium, and death generally after one or two convulsions.

Anæmia is characteristic of this mode of death.

Death by Asthenia.—When the contractile power of the heart fails from loss of ganglionic nerve-power. The pulse becomes feeble and frequent and may cease to be felt, muscular debility is extreme, but the senses may remain perfect and often painfully acute, with the

intellect clear to the last. Fainting is characteristic of this mode of death, as distinct from syncope.

Death by Starvation is a mode of dying in which syncope and fainting are eventually combined.

Death by Suffocation occurs when the function of respiration is suspended, as when the access of air to the lungs is prevented. The symptoms of approaching death in this way are strong but ineffectual efforts to contract the respiratory muscles, struggling efforts to respire, amounting to agony of short duration, followed by vertigo, loss of consciousness and convulsions. Finally all efforts cease, twitching or tremors of the limbs alone remain, the muscles relax and the sphincters yield. The heart may continue to beat for three minutes and fifteen seconds after all other signs of life are past, and even the pulse may be felt. On this fact rests the hope of resuscitating persons dying in this way, if artificial respiration be resorted to at proper time and persevered in.

Death by Coma occurs when consciousness is lost in an appearance of sound sleep, from which the patient cannot be roused, or only partially. There is a gradual blunting of sensibility to external impressions, slowness of respiration, the respiratory effort being often delayed, and finally performed with a sudden noise and jerking effort, to which the name of stertor or stertorous breathing has been given. Here death commences at the brain.

ABBREVIATIONS.

Together With the Original Terms and Phrases, Translated into English.

℞	Recipe	Take
M.	Minimum	Minim, 1-60 of fluid drachm
℈	Scrupulum	Scruple
ʒ	Drachma	Drachm; three scruples, or ⅛ part of an ounce—liquid
℥	Uncia	An ounce
lb.	Libra	A pound weight
a a.	Ana	of each
Add.	Adde	add
Ad. Lib.	Ad libitum	at pleasure
Admov.	Admove	apply
Alt. hor.	Alternis horis	every alternate hour
Aq.	Aqua	water
Aq. bull.	Aqua bulliens	boiling water
Aq. dest.	Aqua destillata	distilled water
Aq. font.	Aqua fontana	spring water
Aq. mar.	Aqua marina	sea water
Aq. pur.	Aqua pura	pure water
B. A.	Balneum arenæ	sand bath
Bib.	Bibe	drink
Bis. ind.	Bis indies	twice a day
Bol.	Bolus	a large pill

Bull.	Bulliat	let it boil
Cap.	Capiat	let him take
C. N.	Cras nocte	to morrow night
C. M.	Cras mane	to-morrow morning
Cochl.	Cochleare	spoonful
Coch. amp.	Cochleare amplum	tablespoonful
Coch. mag.	Cochleare magnum	tablespoonful
Coch. med.	Cochleare medium	dessertspoonful
Coch. parv.	Cochleare parvum	teaspoonful
Colat.	Colatus	strained
Cong.	Congius	a gallon
Coq.	Coque	boil
Cort.	Cortex	bark
Cuj.	Cujus	of which
Cyath.	Cyathus	a glassful
Decub.	Decubitus	lying down
Det.	Detur	let it be given
Dieb. alt.	Diebus alternis	every alternate day
Dieb. tert.	Diebus tertius	every third day
Dil.	Dilutus	dilute
Dim.	Dimidius	one-half
Div.	Divide	divide
Don.	Donec	until
Dos.	Dosis	a dose
Ejusd.	Ejusden	of the same
Emp.	Emplastrum	a plaster
Ext.	Extractum	extract
F. (or) Ft.	Fiat	let there be made
Fl.	Fluidus	fluid
Flor.	Flores	flowers
Ft. mist.	Fiat mistura	let a mixture be made

Ft. pil.	Fiat pilulæ	let pills be made
Ft. s. a.	Fiat secundum artem	let there be made according to art
Fol.	Folium	a leaf
Fot.	Fotula	a fomentation
Gr.	Granum	grain
Gtt.	Guttae	drops
Guttat.	Guttatim	by drops
Haust.	Haustus	a draught
Hor. decub.	Horâ decubitus	at bed time
H. S.	Horâ somni	on going to sleep
Hydr.	Hydrargyrum	mercury, calomel
Inj. enem.	Injiciaturenema	let a clyster be given
Intern.	Internis	the inner side
Jusc.	Jusculum	broth
Jux.	Juxta	near to
Lact.	Lactis	of milk
Lat. dol.	Lateri dolenti	to the side affected
M.	Misce	mix
Mac.	Macera	macerate
Mass.	Massa	a mass
Mod. præs.	Modo præscripto	in the manner directed
Mor. sol.	More solito	in the usual way
Muc.	Mucilago	mucilage
N.	Nocte	at night
Nat.	Nates	the buttocks
Nih.	Nihil	nothing
Nuch.	Nucha	the nape of the neck
O.	Octarius	a pint
Ol.	Oleum	oil

Omni.	Omnis	all
Omn. hor.	Omni hora	every hour
Ovum.	Ovum	an egg
Pan. bis.	Panis biscoctus	biscuit
Pan. naut.	Panis nauticus	sea biscuit
Pan. tost	Panis tostus	toasted bread
Pan. trit.	Panis triticus	wheat bread
Pil.	Pilula	pill
Poc.	Poculum	a cup
P. R. N.	Pro re nata	according to the nature of the case
Pur.	Purificatus	purified
Q. p.	Quantum placet	as much as you please
Q. s.	Quantum sufficiat	as much as is sufficient
Rad.	Radix	root
Rep.	Repetatur	let it be repeated
S.	Signa	write
Sacch.	Saccharum	sugar
Salt.	Saltem	at last
Sang.	Sanguis	blood
Sed.	Sedes	stool
Solv.	Solve	dissolve
S. S.	Semis	half
S. V.	Spiritus vinosus	ardent spirits
S. V. R.	Spiritus vinosus rectificatus	spirit of wine.
S. V. T.	Spiritus vinosus tennis	proof spirit, equal parts alcohol and water
T. d.	Ter die	three times a day

Tuss. Mol.	Tussis Molestante	when the cough is troublesome
Umb.	Umbilicus	the navel
Ung.	Unguentum	ointment

VOCABULARY OF DEFINITIONS.

Abdo'men. The largest cavity in the body; the belly.
Abduc'tor. A muscle producing abduction.
Abnor'mal. Not normal; irregular; contrary to rule.
Abra'sion. A scratch of the skin or mucous membrane.
Ab'scess. A cavity containing pus, result of inflammation.
Acetab'ulum. Cup-like socket of thigh bone, receiving the head of the femur.
Acous'tics. The science of sounds.
Actual Cautery. Cauterization by hot metal or fire.
Acupunc'ture. Bleeding by puncturing with needles.
Acute. Severe, rapid, brief and energetic; also, sharp pointed.
Adeni'tis. Glandular inflammation.
Adynam'ia. Defect of strength; debility; weakness.
Affec'tion. Disease; disorder.
Affu'sion. Pouring upon, as water upon the body.
Algid. Chilled.
Alve'oli. Sockets for the teeth.
Amauro'sis. Blindness, partial or complete.
Amygdalæ. Tonsils.
Anæ'mia. Morbid condition from diminution of blood or its red corpuscles.
Anæsthetic. An agent producing temporary insensibility to pain.
Anaphrodis'iac. Pertaining to or promoting absence or diminution of sexual power or desire.
Anasar'ca. Serum in areolar tissues; general dropsy.

Angi'na Pec'toris. Pain in the heart, with sense of strangulation, etc.

Ankylo'sis. Stiff joint; articular immobility.

Anodyne. Agent diminishing sensibility to pain.

Anorexia. Want of appetite.

Anthelmin'tic. Destructive of intestinal worms.

Antisep'tic. Antagonistic to putrefaction.

Antispasmod'ic. Tending to relieve spasmodic affections.

Anur'ia. Deficiency of urine.

A'nus. Inferior orifice of intestinal canal.

Aor'ta. The main trunk of the arterial system, arising from left ventricle of heart.

Apex. Summit, or pointed extremity.

Aphrodis'iac. Tending to stimulate sexual desire or power.

Ap'nœa. Absence or difficulty of respiration.

Ap'oplexy. Effusion of blood into an organ; sudden paralysis from cerebral hæmorrhage.

Arach'noid. A web-like, serous membrane of the brain.

Arthritis. Gout; articular inflammation.

Ascites. Serous effusion into cavity of peritoneum; abdominal dropsy.

Astringent. Agent contracting organic tissues, arresting secretions, etc., *e. g.*, *alum*.

At'rophy. Wasting of a part from defective nutrition.

Au'ral. Relating to the ear.

Ausculta'tion. Process of determining condition of the body by listening to sounds produced, especially over chest, etc.

Au'topsy. Personal inspection; applied to post-mortem examination.

Axil'la. Armpit.

Bacte'ria. Micro-organisms; microbes.

Bal'sam. Balm; resinous products containing benzoic acid.

Barom'eter. Instrument showing the pressure of the air.

Bile. Bitter, liquid secretion of the liver.

Bouillon. Jus; nutritive broth.

Cada'ver. Corpse.

Cal'culus. Stone-like secretion liable to form in various parts of the animal body, as renal, etc.

Cal'lus. New osseous tissue formed about the uniting fracture of a bone.

Carcino'ma. Cancer.

Car'dia. Heart; also, orifice of the stomach.

Ca'ries. Ulceroid inflammation of bone.

Cataplasm. A poultice.

Catarrh. Inflammation of mucous membrane, as of nose and throat.

Cat-gut. Cord prepared from sheep intestines, used for ligatures.

Cathet'er. Slender surgical tube, for draining bladder, etc.

Centigramnie. Hundredth part of a gramme; about 0.17 of grain, avoirdupois.

Centilitre. Hundredth part of a litre; about 0.61 cubic inch.

Centimetre. Hundredth part of a metre; abont 0.39 of an inch.

Cer'ebral. Relating to or involving the brain.

Cervix. The neck.

Charpie. Filaments from old linen for wound dressing.

Chore'a. St. Vitus dance; nervous, involuntary, spasmodic muscular contraction.

Chyle. Milky fluid converted from chyme and absorbed by lacteals.

Chyme. Pulpy mass of digested food and gastric juice.

Clys'ter. Enema.

Coc'tion. Digestion.

Collyr'ium. Eye lotion.

Congen'ital. Existing at birth, as disease, malformation, etc.

Consump'tion. Wasting or emaciation of the body; phthisis pulmonalis.

Conta'gion. Transmission of poisonous principle; infection.

Contra-in'dicated. Forbidden by the pathological condition.

Contrecoup. Cranial fracture on side opposite the blow.

Cosmet'ic. An external medicine used to beautify the skin.

Co'rium. The derma, cutis or internal cutaneous layer.

Cor'puscle. A minute body.

Cremation. Incineration; consuming a body by burning.

Croup. Inflammation of the larynx and trachea.

Cyano'sis. General venous congestion from affections of lungs and heart, with admixture of venous and arterial blood.

Cyst. A sac; accidental membranous pouch containing fluid.

Cysti′tis. Inflammation of the bladder; vesical catarrh.

Defeca′tion. The act of evacuating fæces.

Degluti′tion. The act of swallowing.

Dejec′tion. Discharge of fæces; depression.

Delir′ium Tre′mens. Trembling delirium from alcoholism; mania a potu.

Deple′tion. Emptying; blood-letting; purgation.

Diaphragm. Midriff; transverse muscular partition between thorax and abdomen.

Dicrotic. "Double;" said of the pulse.

Disease′. Morbid condition, from functional disturbance, organic derangement or anatomical abnormality.

Disinfec′tant. Agent destroying cause of infection and preventing growth of septic organisms.

Dissolution. Process of dissolving; death.

Diuret′ic. Promoting diuresis; agent increasing secretion of urine.

Dor′sal. Pertaining to the back or posterior surface.

Douche. Shower; cold affusion; fluid current directed on internal or external surface.

Dras′tic. Operating effectually, as purgatives.

Dys′entery. Inflammation and ulceration of mucous membrane of large intestine, often with bloody evacuations.

Dyspep′sia. Indigestion; difficult or imperfect assimilation of food.

Dyspnœ′a. Difficult respiration.

Dysu′ria. Difficult or painful micturition.

Ecchymo′sis. Extravasation of blood into areolar tissue.

Econ′omy. The whole animal organism.

Elec'trode. Pole; point where electric current enters or leaves a body.

Elimina'tion. The act of expelling; use of purgatives.

Elix'ir. Sweetened, medicated, alcoholic preparations.

Em'esis. Vomiting.

Emphyse'ma. Wind-dropsy; swelling from air diffused in cellular tissue.

Empye'ma. Abscess of chest; pus in cavity of pleura.

Endem'ic. Applied to diseases peculiar to a people or locality.

En'ema. Clyster; cleansing, nutritious or medicinal injection into rectum.

Enteri'tis. Inflammation of the intestines, especially small intestines.

Enure'sis. Incontinence of urine.

Epidem'ic. Common to many people; prevailing disease.

Ero'sion. Destruction by ulceration.

Exanthem'ata. Eruptive diseases, generally with infectious fevers.

Excis'ion. The act of cutting off.

Excre'ta. Urine and fæces.

Fæces. Excremental discharge from the bowels.

Fasciæ. Fibrous membranes investing muscles, etc.

Feb'rifuge. Antipyretic; agent removing or mitigating fever.

Felon. Whitlow.

Ferrum. Iron.

Fester. To suppurate; to form small abscesses after inflammation.

Fibre. Filament; thread-like structure.

Fol'licle. Little bag; minute secreting cavity.

Gastric Juice. The digestive fluid secreted by the stomach.

Gas-tri'-tis. Inflammation of the stomach.

Gas-tro-bro'-sis. Ulceration and perforation of the stomach.

Gas-tro'-to-my. The operation of opening the belly.

Gen-e-ra'tion. The reproduction of organized beings.

Gen-i-ta'-lis. Belonging to generation, as the sexual organs.

Ge-nu. The knee.

Germ. The rudiment of a new being.

Gin' giv-a. The gum.

Gland. A name given to various small ovoid organs of the body, both secretive and excretive in function.

Gleet. The chronic stage of gonorrhœa, with muco-purulent discharge.

Glos'sa. The tongue; also, the faculty of articulate speech.

Gout. A disease characterized by an excess of uric acid or alkaline urates in the fluids of the body.

Gut. A common name for intestine.

Hæmatu'ria. Blood in the urine.

Hæmophil'ia An abnormal tendency to hæmorrhage, or ease of bleeding.

Hæmop'tysis. The spitting of blood.

Hæm'orrhage. The flowing of blood from wounded or broken vessels.

Hæm'orrhoids. Piles.

Hæmostat'ic. Having the property to arrest hæmorrhage.

Harts'horn. A name popularly given to ammonium hydrate.

Healthy. That condition of the body and its organs necessary to the proper performance of their normal functions.

Heart. The organ giving the initiative and chief impulse to the circulation of the blood.

Hec'tic. A word now commonly used in connection with certain symptoms of phthisis.

Hemiple'gia. Paralysis of the motor nerves of one side of the body.

Hepat'ic. Pertaining to or belonging to the liver.

Hermaph'rodite. One with some congenital malformation of the genital organs that makes the determination of sex somewhat doubtful.

Her'nia. A tumor formed by the protrusion of the contents of a cavity through its wall.

Hives. A name loosely applied to almost any papular eruption of the skin.

Hy'dragogue. A purgative that causes liquid alvine discharges.

Hyper'trophy. Excessive nourishment or increase in size of any part or organ of the body.

Im'becile. Feeble in mind.

Incis'ion. The act of cutting into any tissue of the body.

Incom'petence. Inability to perform natural functions.

Incon'tinence. Inability to restrain the fæces or the urine; involuntary evacuation.

In'durated. Hardened.

Infec'tion. The communication of disease germs or virus by any means, direct or indirect.

In'flux. The act of flowing in.

In'guinal. Pertaining to the groin.

Insane'. Deranged or diseased in mind.

In si'tu. A Latin phrase meaning in a given or natural position.

Insola'tion. Sunstroke; in pharmacy, the drying or bleaching of substances by exposure to the sun.

Insom'nia. Want of sleep; inability to sleep.

Intes'tine. The part of the digestive tube extending from the stomach to the anus.

Inunc'tion. The act of rubbing a fatty or oily substance into the skin.

Ir'ritable. Easily inflamed.

Ischu'ria. Retention or suppression of urine.

Jaundice. A disease arising from diseases of the liver.

Jug'ular. Pertaining to the throat.

Ku'myss (Koumiss). Originally fermented mare's milk. Largely made in United States by fermenting cow's milk, ℥xxix, with yeast, ℥ss, and grape sugar, ℥ii. Made in quart bottles and drawn with a champagne faucet.

La'bia. The lips.

Labor. Work; parturition; bringing forth young.

Lac. Milk.

Lacera'tion. Mechanical rupture by a tearing action.

Lach'rymal. Having reference to the organs of the secretion, transfer or excretion of tears.

Lang'uor. Lassitude; disinclination to take bodily exercise or to exert one's self.

Laryngi'tis. A catarrhal inflammation of the larynx, accompanied by sore throat, hoarseness, and, usually, painful deglutition and cough.

Lar'ynx. The upper part of the air passage between the trachea and the base of the tongue.

Lax'ative. An agent that loosens the contents of the bowels.

Le'sion. An injury, hurt or wound in any part of the body; in pathology, any morbid change.

Liga'tion. The operation of tying; used especially of arteries.

Limo'sis. Unnatural appetite; also, a name given to a class of diseases distinguished by depraved appetites.

Li'num. Flaxseed.

Lithot'omy. Incision into the bladder to remove calculus.

Lithot'rity. Crushing a stone in the bladder into fragments small enough to pass the urethral canal.

Lum'bar. Pertaining to the loins, especially the region about the loins.

Ma'nia. Delerium or madness not accompanying fever or acute disease.

Man'icure. The process employed in caring for and beautifying the hand.

Massage. Rubbing; to knead.

Masturba'tion. Production of the venereal orgasm by the hand; secret vice.

Mater'ia Med'ica. A name used to designate the materials and substances used as medicines.

Mea'tus. A passage.

Melancho'lia. An affection marked by depression of spirits and gloominess; melancholy.

Membrane. In anatomy; a term applied to almost any thin, enveloping or lining substance.

Menin'ges. A name applied to the membrane of the brain; the dura mater, pia mater and arachnoid.

Men'ses. The recurrent monthly discharge of blood during sexual life, from the genital canal of the female.

Mesente'ries. Those folds of the peritoneum which connect certain walls of the intestine with the abdominal wall.

Mic'robe. The general name of micro-organisms, or organic structures, whether animal or vegetable, that require the microscope for their study.

Mobil'ity. The condition of being movable.

Mo'dus Operan'di. Method of the performance of an action.

Mor'bid. Pertaining to disease or a departure from health.

Myal'gia. Any pain of the muscles.

Myeli'tis. Inflammation of the spinal cord.

Nape. The back part of the neck; the micha.

Narcot'ic. A hypnotic that also allays pain.

Na'ris. The nostril.

Na'sus. The nose.

Na'tes. The buttocks.

Nau'sea. Sickness at stomach, with inclination to vomit.

Necro'sis. Mortification or death of a bone, corresponding to gangrene of soft parts.

Nephri'tis. Inflammation of the kidneys.

Neural'gia. Nerve pain.

Nor'mal. That which conforms to the natural order or law.

Nos'trum. A term loosely applied to any quack medicine or cure-all.

Nox'ious. Harmful, poisonous or deleterious.

Nurse. One devoting himself or herself to the care of the sick as a life work or profession.

Nu'trix. A nurse.

Obstet'rics. The care of women in pregnancy, childbirth and the puerperal state.

Œde'ma. Effusion of serous fluid in the sub-cutaneous areolar tissues.

Opthal'mia. An inflammation of the superficial tissues of the eye.

Orchi'tis. Inflammation of the testicles.

Orchot'omy. Castration.

Or'ifice. The mouth or entrance to any cavity.

Orthopæ'dic. The means of straightening and remedying congenital or acquired deformities of any age.

Os (oris). The mouth. ["By the mouth" per os; often incorrectly written "per orem"].

Os (ossis). A bone.

Osteo Arthri'tis. A chronic inflammation of the joints accompanying rheumatism or caused by it.

Otal'gia. Any pain in the ear; earache.

Osteot'omy. Incision or surgical operation upon bone.

Pack. A blanket wrung out of hot or cold water and quickly wrapped about the patient.

Pal'ate. The upper wall or roof of the mouth.

Pana'da. Bread softened in water; also, a bread poultice.

Pang. A sharp momentary pain.

Paraple'gia. Paralysis of the body, usually of the lower extremities.

Par'asite. An animal or vegetable that lives upon or infests the body.

Pare'sis. Slight paralysis; partial loss of muscular power.

Pathoge'nic. Having the property or power to cause disease.

Pec'toral. Pertaining to the breast.

Pe'dal. Pertaining to the feet.

Pediculo'sis. A term used to designate the symptoms produced by lice.

Pep'sin. A name of indefinite meaning given to the digestive principle of the gastric fluids.

Percus'sion. The striking lightly upon any part of the body.

Perios'teum. A tough connective tissue surrounding bowels, serving as an attachment for tendons.

Peritone'um. The membrane lining the interior of the abdominal cavity and surrounding the viscera.

Phar'macist. An apothecary.

Phymo'sis. Elongation of the prepuce and constriction of the orifice, so that the foreskin cannot be retracted to uncover the glans penis.

Phlebi'tis. Inflammation of a vein.

Phlegm. The viscid, stringy mucous expectorated or vomited.

Phren'sy. Insanity; mania; frenzy.

Phthis'ical. Pertaining to or affected with phthisis.

Pi'lus. Hair.

Plas'ma. Liquor sanguinis; the fluid part of the blood.

Pneumo'nia. Lung fever; inflammation of one or more lobes of the lungs.

Polyclin'ic. A hospital with many beds, or where all diseases are treated.

Pol'ypus. A predunculated tumor found especially in the cavities of the nose, ear, rectum, etc.

Poly'uria. Excessive secretion of urine.

Posolog'ical. Pertaining to posology or quantitative dosage.

Post'humous Occuring after death.

Post-mor'tem. Pertaining to a period or condition after death.

Post-par'tum. Used particularly in connection with hæmorrhage, etc., occurring after childbirth.

Poul'tice. An emulsion of some soft substance, as slippery elm, meal, etc., for application to the skin.

Predispos'ing. Acting under an unusually slight exciting cause.

Pre'puce. The foreskin of the penis.

Pri'mary. First in time.

Procta'gra. Pain in the anal region.

Procum'bent. Lying flat, face downward.

Progno'sis. The prevision and judgment concerning the progress and result of a disease.

Prolap'sus. The falling forward or down of some part, so that it protrudes beyond its normal boundary.

Prophylax'is. The hygienic or other precaution conducive to prevention of disease.

Pty'alism. A condition marked by an excessive secretion of saliva.

Pul'monary. Pertaining to the lung.

Punc'ture. A wound or hole made by a pointed instrument.

Pupil. The round aperture in the iris of the eye.

Pur'gative. A medicine producing watery evacuation of the bowels.

Pus. The fluid product of a suppurating wound, sore or abscess.

Pyret'ic. Pertaining to or affected with fever.

Pyrex'ia. Elevation of temperature above the normal. Fever.

Pyu'ria. Pus in the urine.

Quinsy. An acute, severe inflamation of the tonsils accompanied by fever.

Reac'tion. The response of an organ, tissue, or the system, to a stimulus, agent or influence.

Rec'tum. The lower part of the large intestine.

Re'flex. A bounding back or return of an impulse or body.

Relapse. The return or recurrence of a disease during convalescence, or shortly afterward.

Re'nal. Pertaining to the kidneys.

Resec'tion. Excision of a portion of bone, nerve, or other structure.

Respira'tion. The inspiration and expiration of air by the lungs.

Retch. To strain at vomiting.

Reten'tion. The holding back or stoppage of any of the natural discharges of the body.

Rig'or. Coldness, stiffness or rigidity.

Sa'nies. The thin, fœtid, greenish serous fluid discharged from fistulas.

Satura'tion. In pharmacy, a term used to denote that a fluid holds as much of a soluble substance as it can dissolve.

Sat'urinism. Lead poisoning.

Sed'ative. An agent that exerts a soothing effect by lowering functional activity.

Seiz'ure. The sudden onset of a disease or an attack.

Senil'ity. The weakness and decrepitude characteristic of old age.

Sep'tic. Relating to putrefaction.

Seque'la. The consequences or abnormal conditions following the abatement of a disease.

Se'ton. A sinus kept from healing by the introduction and drawing through it of a thread.

Si'nus. Applied to the pathway or canal leading from an abscess.

Slough. The separating and dying particles of tissue in suppurative and ulcerative processes.

Spermat'ic. Pertaining to the semen.

Spermatorrhœ'a. Involuntary discharge of semen without sexual excitement.

Splint. A piece of wood, or other material for keeping the ends of a fractured bone in permanent contact while healing.

Spu'tum. The secretion ejected from the mouth in spitting.

Squa'mous. Scaly.

Sta'sis. A condition of standstill of the current of any of the fluids of the body.

Ster'tor. Sonorous breathing, or snoring.

Stool. The fæces. The evacuation of the bowels.

Styp'tic. A medicine or agent that causes vascular contraction of the blood vessels.

Subcuta'neous. Under the skin.

Suda'tion. The act of sweating.

Suppura'tion. The formation of pus.

Syno'via. The lubricating fluid secreted within synovial membranes.

Tenot'omy. The operation of cutting a tendon.

Test'es. The two glandular bodies, situated in the scrotum, that secrete the semen.

Tet'anus. A spasmodic and continuous contraction of muscles, causing rigidity of part they supply.

Ther'mal. Pertaing to heat.

Thorac'ic. Pertaining to the chest or thorax, and also to certain of its organs.

Thrombo'sis. The formation of a clot of blood at the place of deposit of an obstruction.

Toxicol'ogy. A treatise on the nature and effect of poisons.

Tra'chea. The windpipe.

Transfu'sion. The transfer of blood or other liquid into the veins.

Trau'ma. A wound.

Tris'mus. Lockjaw.

Tu'nica. An enveloping or covering sheath.

Un'gual. Pertaining to a nail of the hand or foot.

Ure'a. The chief solid constituent of urine.

Ure'ter. The canal or tube conveying the urine from the kidney to the bladder.

Vacci'nal. Pertaining to vaccination or vaccine.

Vas'cular. Pertaining to vessels.

Vene'real. Pertaining to the sexual passion.

Ver'tigo. Giddiness, dizziness. The sensation of a lack of equilibrium.

Vis'cera. A name somewhat loosely applied to the contents of the abdomen.

Wet-pack. Wrapping a patient with a wet sheet covered with dry blankets.

Xera'sia. A disease of the hair marked by cessation of growth and excessive dryness.

Zymol'ogy. A treatise on the origin and nature of fermentation. Bacteriology.

Etymological Factors Common in Medical Terminology.

(The following roots and affixes will frequently afford a clue to the construction and signification of a technical term.)

A—an— The equivalent of our prefix *un*—, or *in*—; denotes, an abscence or want of the thing or quality expressed by the principal, *e. g.*, *adynamia*, *aphasia*, *atony*, *etc.*

Amphi—(or amph) Upon both sides, in two ways, as in *amphiarthrosis*, *amphibia*, *etc.*

Ana—— Up, through again, *e. g.*, *anabolism*, *anasarca*, *anatomy*, *etc.*

Anti—(or ant) *Against*, opposed to, opposite of, as *antaphrodisiac*, *antipyretic*, *antiseptic*, *etc.*

Apo—— Off, away, upon, *e. g.*, *aponemosis*. *apoplexy*, *etc.*

Dia—— Through. Examples: *Diabetes*, *diagnosis*, *diaphragm*, *diarrhœa*, *ctc.*

Dys—— Difficult, defective, painful, *e. g.*, *dysentery*, *dyspnœa*, *dysuria.*

Ec—Ex—Ecto— Out, outside, away from, as in *Ecchymoses*, *ecdemic*, *exanthema*, *etc.*

Em—En— Within; as *embolus*, *endemic*, *embryo.*

Endo—Ento— Within, internal, *e. g.*, *endocardium*, *entoblast*, *etc.*

Entero—— The intestine, as in *enterocele*, *enterostomy*, *etc.*

Epi—— Upon, over, above, *e. g.*, *epistaxis*, *epidermis.*

Extra—— Outside, *e. g.*, *extravasation*, *extroversion.*

Gastro—— Stomach; as *gastralgia.*

Hæm, or Hem— Blood; as *hæmorrhage.*

Hemi—— Half, as in *hemiplegia, hemicrania, etc.*

Hetera—— Different, opposite, *e. g., heteromfection, heteropathy, etc.*

Hydro—Hydr— Water, resembling or relating to water, dropsy, etc., as in *hydrocephalus.*

Hyper —— Excess, over, *e. g., hypertrophy, hyperpyrexia, etc.*

Hypo—— Below, lower; as *hypodermic, hyposthemia, etc.*

Hystero—— Womb; as *hysteralgia.*

Im—In— Privative, negative; as *imperforate, incarceration, insane, incontinence.*

Intro—— Within; as *introversion.*

Infra—— Beneath, below; e. g., inframaxillary, infrascapular.

Inter—— Between; see *intercostal* and others.

Leuco—— Whiteness, *e. g., leuchaemia, leucolyte, leucomaines.*

Lith—Litho— Pertaining to stone, calculus, or lithic acid; see *lithoemia* and others.

Macro—— Largeness, hypertrophy; as in *macroglossia, macromelia.*

Melano—— Blackness, pigmentation, *e. g., melancholia, melano-sarcoma.*

Meso—— The middle, as in *mesoblast.*

Meta—— With, amidst, *e. g., metabolism, metatarsus.*

Micro—— Smallness, *e. g., micrococcus, microglossia, microscope.*

Mon—Mono— Singleness. For example, *monamine, monomania, monorchis.*

Multi—— Number, many, *multilocular, multiparonus.*

Myclo—— Referring to the brain or spinal cord, as in *mycloid*, *myclitis*.

Myo—— Pertaining to a muscle or muscularity. See *Myocarditis*, *Myoma*, *Myopathia*.

Neuro—— Relating to a nerve or neurology. As *e. g.*, *Neuralgia*, *Neurasthenia*, *Neuroglia*.

Odonto——Of the teeth, as an *Odontology*. *Odontalgia*.

Oligo——Fewness or lack of, as *Oligacythmia*.

Opthalmo——Pertaining to the eye, as in *Opthalmia*.

Osteo——Referring to bone. See *Osteoblast*, *etc.*

Oxy——Denoting the presence of oxygen or acidity, as in *Oxygen*, *Oxyhæmoglobin*.

Para—— Through, near, by, by the side of, abnormality. Examples. *Paraclutesis*, *Parotid*.

Peri —— About, around, *e. g.*, *Pericardium*, *Periosteum*.

Poly—Pol— Many, much, *e. g.*, *Polycoria*, *Polyuria*.

Præ—Pre – Before, *e. g.*, *Præcordia*, *Prepuce*.

Pro—— Before, down, as in *Process*, *Prolapse*.

Pseudo—— False, spurious, as in *Pseudarthrosis*.

Pyo—— Pertaining to pus, or purulency, *e. g.*, *Pyogenic*.

Pyr—Pyro— Concerning fire or heat or inflammation *e. g.*, *Pyrexia*.

Retro—— Backward, behind, *e. g.*, *Retroversion*.

Sub—— Beneath, under as *Subclavian*, *Subluxation*.

Super——Upon, above, excess of *e. g.*, *Supercilium*.

Supra——Above, upon, superior to, as *Supraorbital*.

Sym—Syn— With, together, same, *e. g.*, *Symphysis*, *Synalgia*.

SUFFIXES.

———æmia. Having reference to blood, *e. g.*, *Anæmia*, *Mithæmia*, *Pyaemia*, *Uraemia.*

———agogue. Leading out, expelling, as *Hydragogue*, *Sialagogue*, *etc.*

———ogra. Denotes an acute attack of pain in the part, as *Arthiagra*, *Podagra.*

———algia. Pain, expressed by the chief word, *e. g.*, *Cephalgia*, *Nostalgia*, *Myalgia.*

———cele. Protusion, tumor, *e. g.*, *Hydrocele*, *Crysto.cele.*

———ectomy. Excision, exsection, as in *Nephrectomy*, *Splenectomy.*

———graph—graphy. Writing, *e. g.*, *Spymograph*, *Demography.*

———itis. Inflamation, *e. g.*, *Gastritis*, *Otitis*, *etc.*

———logy. The science treating of, as *Bacteriology*, *Dermatology*, *Pathology.*

———mania. The chief word denotes the principal symptom of the mental affection, *e. g.*, *Monomania.*

———oid. Similar, in shape, etc., as in *Choroid*, *Cuboid*, *Sphenoid*, *Ciphoid.*

———oma. A tumor, as in *Glioma*, *Sarcoma.*

———opia. Pertaining to the eye or vision, as in *Myopia*, *etc.*

———pathy. Disease, also a method of cure as *e. g.*, *Adenopathy*, *Homœopathy*, *Hydropathy.*

———phobia Fear, as *Hydrophobia.*

———plasty. Surgical plastic operation upon a part, *e. g.*, *Blepharoplasty.*

———raphy. A stitching or suturing of a part, as *Enterorrhaphy, Hymenorrhaphy.*

———rhagia. Hemmorhage or excessive discharge, *e. g., Blennorrhagia.*

———rhœa. Flow, excessive discharge, *e. g., diarrhœa.*

———scopy. An examination, as *Opthalmoscopy.*

———tomy. Cut, incision, *e. g., Laparotomy, Tenotomy.*

———uria. Urine; as *Glucosuria, Polyuria.*

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